"कक्त समहांत ब्राम्हादेवानें प्रारकना करान्यास आराक केला, 'हो अस्पित्ती स्कीतीं लयकरा परात्परा परामे- -श्वरा तिज़न्या शक्तीस पारा नाहीं।"

" भक्त समूहांत ब्रम्हदेवाने प्रार्थना करण्यास आरंभ केला. हे उत्पत्ति स्थिति लयकरा परात्परा परमेश्वरा तुझ्या शक्तीस पार नाहीं "

Fig. 153. **A suggestion quoted by Br. Savarkar.[23]**

17. Gangadhar Abaji Bhagwat[24]

Vowels स्वर. अ, इ, इ, (ई) उ, ऊ (ऊ) ऋ, ऋ, ए, ए (ऐ) ॐ (ओ) ॐ (औ) अं (अं) अः

Signs चिन्हें. । काना ('अ') दर्शक) । (अर्धा काना) - (योगचिन्ह) ँ (अनुस्वार).

Conso-nants Full & half क, क, रू, ग, घ, ङ । च, छ, छ, ज, झ । ट, ठ, ड, ढ, ण । त, थ, द, ध, न, । प, फ, फ, ब, भ, म । य, र, ऱ, ल, ल, व । श, ष, स, ह, ऽ, (ह्) क्ष, ळ ज्ञ ।

Bārākhadi ख, खा, ख्इ, ख्इ, ख्उ, ख्ऊ, ख्ऋ, ख्ऋ, ख्ए, ख्ए, ख्ॐ, ख्ॐ, खं खः

Fig. 154. **Fount of Bhagwat type and a specimen Barakhadi Bhagwat type**

चालू (हस्तलिपि)	(मुद्रण लिपि)
आई चल	आइ चल
खाऊ खा	खाउ खा
मनें वाच	मन्ए वाच
गाणें ऐक	गाण्ए एक
मोरू आला	म्ॐरउ आला
औषध पी	ॐषध प्इ
अंबारी आण	अंबान्इ आण

The suggestion of Nirnaya-sagar (*Fig. 147*) was further elaborated by G. A. Bhagwat of Bhusawal, who issued a pamphlet on Nagari Script Reform. The date of publication of this pamphlet is not recorded. However, it must have appeared sometime between 1936 and 1941. Bhagwat advocated the placing of the vowels after the half-consonants to construct full letters. In his system there are 13 vowels, 4 vowel-marks and 41 consonants.

Bhagwat has admitted that his reforms would result in introducing the spelling system in Devanagari.

18. Kakasaheb Kalelkar (1935)[25]

Kakasaheb Kalelkar, Chairman, *Nagari Lipi Samiti*, issued a note on a common script for Hindi, Marathi and Gujarati for consideration at the Indore Sahitya Sammelan. His suggestions are :

સર્વ પ્રાન્તીય ભાષાઓ માટે
આજ અક્ષરો અુપયોગમાં
આવે એ આદર્શ છે। એના
પ્રાન્તીય રૂપો ઘણા હોઇ શકે।

क ख ग घ ङ ह अ आ अि अी
च छ ज झ ञ य अ॰ अः अ॰ अः
ट ठ ड ढ ण र अ॰ अः अ॰
त थ द ध न ल आ॰ आः आ॰
प फ ब भ म अं॰ अः॰ अः॰
य व र ल ळ श ० १ २ ३ ४ ५ ६
ष स ॐ श्री क्ष ज्ञ ७ ८ ९

Fig. 155. **Kakasaheb Kalelkar's Devanagari**

(1) The Gujarati form of ખ may be accepted.

(2) The short bar of ह द ट etc. may be made oblique in order to eliminate the possibility of accumulation of ink near the joints.

(3) The same treatment may be given to ह which will simplify its designs.

(4) The Hindi design of ल is accepted as it is with full verti-bar.

(5) The loops of ख, थ, ध, भ and श may be raised above the headline to make the 'look' interesting.

(6) The *Bārākhadi* of अ may be accepted.

(7) The vowel-signs may be placed after the consonants in linear design.

(8) The *reph* may be placed in the order of pronunciation in the form of diminutive र.

(9) The *Mātrās* of ए, ऐ, ओ and औ are drawn in the fashion of branches on a tree.

(10) ॐ may be used for &, i.e. और in Hindi and आणि in Marathi.

(11) The conjuncts may be written in linear design by removing the varti-bar of the first consonants. The letters with small bar and without bar may be joined with ∪ sign.

19. S. N. Benare (1939)[26]

Bhaurao Benare, a retired pensioner phadnis of Pandharpur advocated the removal of the head-line. He also suggested the alteration of the design of the verti-bar in order to fit the letters in the *Swastik* sign.

The vowel-signs suggested by him are as under :

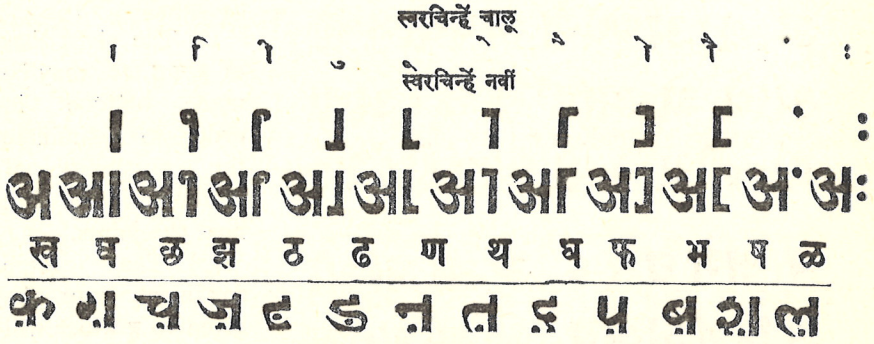


Fig. 156. **Vowel-signs and aspirated consonants suggested by Benare**

He advocated the representation of the aspirates by adding a point at the bottom as is done in Kannada.

In his system the conjuncts are represented by placing a dot between two consonants to denote the combination

न्य=न.य; ट्ठ=ट.ठ; ड्ढ=ड.ढ ; द्र=द.र ; र्य=र.य; र्व=र.व ; र्ह=र.ह

ऋ is to be written as अ॰ and ॲ as अ◡

20. Govind Balvant Bakale [27]

Bakale of Shri Lakshmivijay Press, Sholapur, cut new types according to his scheme. He had set out ten guiding principles :

(1) Eliminate *degrees*.

(2) Abolish two and three-step setting.

(3) Construct the half forms of letters by removing the *Kānā*— छ, ल, ट, व, etc.

(4) Construct full letters by placing the vowel-signs (*Mātrā, Velānti, Ukār*) after half forms of the consonants.

(5) *Mātrās* and *Rafār* should be placed on the top and not after the consonants.

(6) *Mātrās* should not fall on the right side but should stand on left.

(7) Overhangings should be avoided.

(8) Reduce the number of matrices.

(9) The current *look* of the script should not be altered.

(10) See that no difficulties are faced by the script reformers.

टाइपांची संख्या १४० ते १६०

३६ व्यंजने, त्यांचे दुसरें स्वरूप श्र, अ, इ, उ. ए, वगैरे मुख्य ४५ अक्षरें; परतु ती सर्व अर्धी, त्यांचे पुढें काने ठेवून तीं पूर्ण करण्याकरितां काने ७६. शिवाय १० आंकडे, विरामचिन्हें, गणित चिन्हें आण्याच्या आड्या उभ्या रेघा, टीपांचीं चिन्हें वगैरे मामुली टाइपासुध्दां जास्तीतजास्त १६० होतात. कमी करूं इच्छिणारांस १५ ते २० कमी करतां येतील. हे टाईप ठेवण्याकरितां आम्हीं लाकडी १५० घरांची मुद्दाम सिंगल केस बनविली आहे. त्यामुळें खालच्या केसीत १२ पॉइंट पैका तर वरच्या केसीत त्याचा जवा अशी जागेची बचत होते टाइपांची इतकी संख्या कमी असूनही प्र, पृ, वगैरे जोडाक्षरें पूर्वी प्रमाणें कायम राहतात. ट्ट, ठ्ठ, ड्ड, द्ग, द्म, क्ष, वगैरे जोडाक्षरें होळ्यांस न खुपेल अशा रीतीनें नवीन कंपोजमध्यें करणी शिकतात तें दाखविण्या करितांच कांहीं जोडाक्षरें पुढें छापलीं आहेत.

छ ट ढ ह वगैरे पुढें पायमोड चिन्ह आणि जोडचिन्हे घालून छ- ट- अशी अर्धी अक्षरें बनविण्याच्या विकृत स्वरूपापेक्षां आमची हीं अर्धी अक्षरें आणि त्यांच्या साह्यानें बनलेली जोडाक्षरें केणालाही पसंत पडतील, असा भरंवसा आहे.

Fig. 157. **Type designed by Govind Balvant Bakale**

Bakale's main suggestion was in respect of the one-fourth *kānā* of the letters like छ ट ठ etc. He pointed out that half-forms of these letters can be made by removing the one fourth *kānā*. In fact this is done in respect of 'छ' and 'ळ'. But Bakale introduced *Kānā-Mātrā* with a horizontal joint. He claims that this innovation allows good joints and helps in retaining the special feature of slanting *mātrās*. His article in *Mudran-prakash* is printed in his own type. The alignment of type in this set-up is bad and the print therefore presents a 'look' full of joints distracting the eye. His fount contained 101 types, 45 letters inclusive of half forms of 36 consonants and vowels, 76 *kānā-mātrds*, 10 figures and about 30 other type sorts.

21. Shamrao Shrikrishna Velingkar[28]

Velingkar of Gwalior in his article "Nagari Script in the new style" suggested abolishing the practice of placing the vowelsigns at the top and bottom. According to him 17 vowels should be written as—

Present style अ आ इ ई उ ऊ ऋ ॠ ए ऐ.

Proposed style अ आ इ इ॰ अु अू रु रू ए अय्.

Present style ओ औ अं अः अॅ अॅं अॉ.

Proposed style अ॰ अव् अ॰ अः अ॰या. अ॰या अ॰आ

His other suggestions are :

(1) The designs of certain consonants may be written in the revised style :

ख = ष्ठ ज्ञ = द्न्य
ञ = य॰ (यं) ल = ल
क्ष = क्ष श = श

(2) The aspirated consonants may be written with "ह्" as advocated by Gurjar :

ख = क्ह छ = च्ह ठ = ट्ह थ = त्ह फ = प्ह
घ = ग्ह झ = ज्ह ढ = ड्ह ध = द्ह भ = ब्ह.

(3) The vowel-signs may be joined to the *Kānā* in the same line as advocated by Gurjar.

(4) The half form of the short verti-bar letters may be written as :

ड्, छ्, ट्, र् or ऱ ळ् and ह्

(5) The letters "भ" and "ध" may be written with loop as "भ and ध".

(6) The various forms of "R" combinations or *Rafārs* may be written as :

ɾ in प्रकार may be written as प्रकार
ˆ in राष्ट्र may be written as राष्ट्र
ꟲ in सर्व may be written as सर्व
ꟲ in पृथ्वी may be written as प्रथ्वी.

(7) The *Ukār* "ु" and "ू" may be written as "ु" and "ू".

(8) At certain places the *halant* in "ण् न् म्" etc. may be replaced by half forms. For instance :

ठण्ठण् = ठण्ठण, शक्तिमान् = शक्तिमान, दुडुम् = दुडुम.

(9) The letter "ङ्" (in वाङ्मय) may be written as "ञ" "वाञ्मय". In the alternative, the Hindi form "ङ्" may be used by placing full point after "ङ."

(10) Conjuncts should be written in linear form, i.e. प्रश्न and not प्रश्न.

(11) The quotation marks may be used.

Above reforms should be gradually introduced. The next step would be to :

(12) Join the vowels themselves to the half-letters instead of using the vowel-signs. For instance :

मोरींत = मा॰र्इ॰त, वृंदावन = व्रू॰दावन.

(13) The letters "श्री" and "ॐ" may be written as "श्री" and "अ॰॰"

(14) The *Parasavarṇa* (ङ् ञ् ण् न् म्) may be replaced by *Anuswār* ं.

The total letters in the Velingkar's system would be only 48 as shown hereunder :

श्री ॐ	2
ऋ अ ा इ ई ु ू ए य् ॅ॰ व् ०॰ .: ृ ॄ	18
. : ' , " " ` ।	6
क ग, च ज, ट ड ण, त द न, प ब म,	22
य र ल व श ष स ह ळ	48

The *Bārākhadi* in the Velingkar system would be :

क का कइ कइ॰ कु कू कए कय् कॅ॰ कव् करू करू क॰ क॰॰

The Velingkar Nagari will present the following picture :

दर्शन्इ॰ अवग्हड दइसणा-ए॰ कार्य अभ्यास्ए॰ स॰॰ए॰ जात्ए॰ म्हण॰न द्हइ॰-ए गाड्इ॰ हा॰क-ए !

This sentence in the current style will be :

दर्शनीं अवघड दिसणारें कार्य अभ्यासें सोपें जातें म्हणून धीरे गाडी हांकरे.

22. Acharya Vinoba Bhave[29]

1. The vowels should be represented in the form of *Swarākhadi.*[30]

2. The problem of the accented ण्य in पुण्याय and simple conjunct ण्य in पुण्याचा is being faced by the scholars since long. Acharya Bhave has offered his solution. He has suggested that the या as in पुण्यास is a vowel and may be termed या-*Kānyā* and may be represented by a special sign to distinguish it from the conjunct ण्या in पुण्याय.

3. The accented pronunciation of ए in "करत्ये, जात्ये" may be represented by a special *mātrā*. करतं

4. All the half-consonants in conjuncts may be represented by the *halant*-sign. In justification of the possible pause after the *halant*-sign Acharya Bhave quotes the following words :

लोक-नागरी लिपि-सुधार थोडक्यांत

१ वर्ण-सुधार : ष=ख
२ बाराखडी नीट : रु, रू
३ मोडी वेली : की (ऱ्हस्व), की (दीर्घ)
४ स्वराखडी : अ, आ, अी, अी, अु अू इत्यादि
५ बिंदु-जोडी : वेदांत (वेदान्त), वेदांत
६ साघात जोडाक्षरें पाय-मोड : स्व-राज्य
७ निराघात जोडाक्षरें
(अ) 'या'- कान्या : तुमच्या (च्या)
(आ) 'ये'- मात्रा : मोळीवीकी (क्ये)
(इ) महा-प्राण : 'म (म्ह), 'न (न्ह), 'व (व्ह)
८ दंत-तालव्य : च, ज, झ,
९ ऱ्हस्व 'अ': देहे-दुःख हे सूख मानीत जावे
१० शिरोरेखा छापण्यांत असो लिहिण्यांत नसो.

Fig. 158. Acharya Vinoba Bhave type

विप् to know, विप् + र = विप्र one who knows.

चित् mind, चित् + र = चित्र pleasing to the mind.

5. The महाप्राण in the conjuncts ह्न, ह्म, ह्ल ह्व may be shown by indexing an apostrophe to the letters concerned—

कह्णे = क'णे; तुह्माला = तु'माला; वऱ्हाड = व'राड ; नव्हे = न'वे, वल्हवणे = व'लवणे.

6. The *Ukār* signs in रु and रू may be written in the common style रु रू.

7. The short इ *Mātrā* may be written as ि and the long ई may be written with a loop at the bottom.

8. The sign of short ए in the letters (` ) may be written without the top knot. ` .

9. The letter ख may be replaced by *Modi* ष or क्ष may be used for it.

10. The headline may or may not be used. It may be retained in printing but dropped in writing.

11. There should be provision for short ऍ and short ऑ.

12. Two different points may be used for *Anuswār* and *Anunāsik* one of which should be positioned low.

13. The special Marathi pronunciations च ज झ (Dento-labials) may be represented by a Nukta.

लोक-नागरीतील स्वराक्षरे

::अेक पंथ दो काज::

[शीवाजी न. भावे]

१९४७ साली, 'ग्राम-सेवा मंडळ, नालवाडी, वरधा' या संस्थेने, पू. वीनोबांच्या 'लोक-नागरी' ह्या लीपीवीषयक ३० पानांच्या लहानसे पुस्तक प्रसीद्ध केले. तक्तीतील २३, २४ पानांवर स्वराक्षरे ही लहानसे सदर आहे.

तक्ता – (१) 'अ' ची बाराक्षरे अनेकांना मान्य असून तीमधील अुघड लाभ.

(२) 'क' मधे 'क' वर दोन मात्रा मग 'ऐ' मधे दोन कां नाहीत ? ही वीसंगती समजावून सांगावी लागते.

(३) 'अ' च्या बाराक्षरांने सर्व स्वर 'अ' च्या बनावटी आहेत असे सुचवावयाचे नाही.

(४) 'इ' आणी 'उ' चे आकार 'अ' वरून फरकाने बनले आहेत.

(५) स्वराक्षरीत मुलांची आणी छापक्षानची फार सोय आहे. – असे पांच मुद्दे आले आहेत. ते सर्व स्पष्ट असूनही, स्वराक्षरीतील सोय आणी अुघड लाभ आणखी स्पष्ट होणे शक्य आहे.

अ, आ, इ, ई, उ, ऊ, ऋ, ॠ, ऌ, ॡ, ए, ऐ, ओ, औ

ही देव-नागरीतील स्वराक्षरे. हीमधे १० स्वर मुलांना

Fig. 159 Specimen of type suggested by Acharya Vinoba Bhave[31]

स्वतंत्र शीकावे लागतात। ते लोक-नागरीतील 'अ' चा स्वराअडचीत टळतात; हा एक लाभ।

व्यंजनाशी स्वर जोडत असताना देव-नागरीत ि, ी, ु, ू, ृ, े, ै, ो, ौ, अशी आणखी दहा स्वर-चीह्ने शीकावी लागतात। तीं लोक-नागरीतील 'अ' चा स्वराअडचीत स्वतंत्र शीकावीं लागत नाहीत; हा लोक-नागरीतील स्वराअडचीचा दुसरा लाभ।

या दोन लाभांत १० वळणे टळून लीपी सुलभ होते; 'मणज' समृद्ध होते। गुरूचा गौरव यातच आहे कीं; लघु 'मणज' लहान जीं मुले तीना शीक्षणात अडगळ काढून सहजपणे लाघव 'मणज' प्रावीण्य प्राप्त करून देतो। एवढ्यासाठीच "एकाक्षरलाघवेन पुत्रोत्सवं मन्यंते वैय्याकरणाः" असे संस्कृतात 'मणतात। एक अक्षर जरी टळले, तरी वैयाकरण पुत्रोत्सवाप्रमाणे आनंद मानतात हा तयाचा अर्थ आहे। पुत्रोत्सव 'मणजे वृद्धीचा, नवीन नीर्मळ माणूस प्राप्त झालयाचा आनंद। येथे अडगळ जाऊन जी नवीन स्वच्छता आली तीचा असाच फार मोठा आनंद आहे।

नुसती लोकनागरी स्वराअडची शीकली कीं, स्वर आणी स्वरचीह्ने एकत्र येतात; कारण लोकनागरीत स्वर आणी स्वरचीह्ने यांत संपूर्ण अद्वैत आहे। तम्मुळे 'एक पंथ दो काज' अशी स्थीती नीर्माण होते। 'मणून लोक-नागरी स्वराअडचीला 'एक पंथ दो काज' हे नांव चांगले शोभून दीसते।

Fig. 160. **Specimen of type suggested by Acharya Vinoba Bhave**

23. Dr. D. N. Sahasrabudhe[32]

In an article published in the dailies of Nagpur, Dr. Sahasrabudhe stated that 'for printing purposes, both the simplified and standard Devanagari script and the standardised Roman script be allowed to remain current'. He enumerates the following points to be taken note of regarding simplification and standardisation :

(1) The standardised script should be capable of having in print any Indian language including Sanskrit and the *Vedas*.

(2) The present form of the letters should not be changed as far as possible. If necessary new forms based on these principles may be added.

(3) The proposed forms should be distinct from the different signs used for various purposes, including the ones used in the *Vedas*.

(4) They should be such as to form clear compound letters, the pronunciation of which can be effected without any context or habitual use.

(5) The form of the compound letter ख should be replaced by a suitable one as shown in the chart.

(6) Since by addition of अ, a consonant is turned into full letter, the *kānā* sign of अ in each letter must be distinctly seen on its right:

(*i*) To do this, forms of क फ छ ट ठ ड ढ द र ल ड ळ have to be suitably modified.

(*ii*) Since ङ and ञ are used as nasals only, the sign for ङ is not necessary while that in ञ has to be modified.

(*iii*) Head-line adds to the grace and hence has been retained.

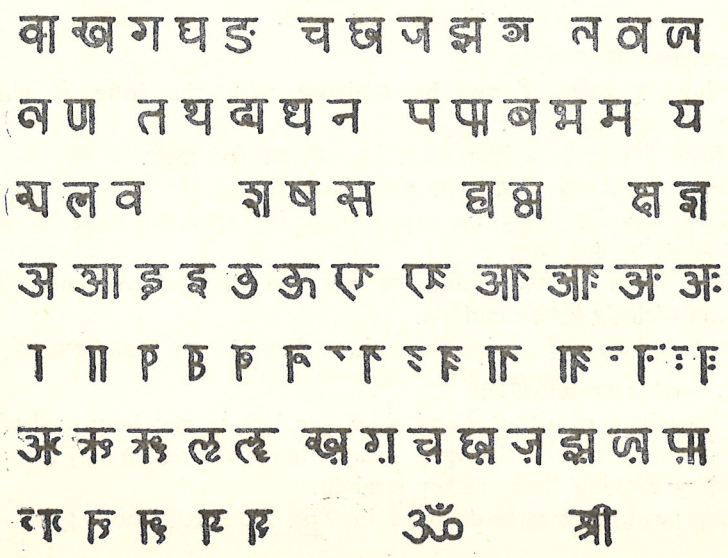


Fig. 161. **Type Fount suggested by Sahasrabudhe**

(7) There are eight letters with distinct alternate pronunciations and this distinction is marked by a dot suitably placed in them.

(8) The forms of the two compound letters ॐ and श्री have been maintained.

(9) The standardised Devanagari script should be further simplified by making it a one-tier script.

(10) The vowels and their signs have to be suitably modified:

(*i*) The forms of the long ई ए ऐ ओ औ अं अः अॅ have to be modified.

(*ii*) The sign ् may be dropped from the letters shown in the chart to indicate absence of vowel अ.

24. Vaman Anant Bhide, Satara (1942)[33]

1. The letters च and ज may be used with a *nukta* to denote the difference in the pronunciation between च in चमचा, ज in ज़नावर and च़ in चहा and ज़ in जपान.

2. ख may be written as क़ to remove the confusion between ख and रव.

3. The long pronunciation of vowels coming at the end of words may be indicated by underline, i.e. बर् झाल्.

4. The simplified conjuncts such as क्रान्ती (क्रान्ती), प्रान्त (प्रान्त), फ्रान्स (फ्रान्स्), स्त्री (स्त्री) should not be used as they occupy more space and reading thereof also becomes difficult.

5. The emphasis on words changes the meaning. This may be shown by underline.

6. In *Sambodhan* the last vowel is long. It may be indicated by writing two semi-colons (;;) after the word.

25. Dr. Panalal (1947)[34]

1. Short इ *mātrā* ि may be replaced with the long ई *mātrā* ी with a short *kānā* ै.

2. *Reph* र्‍ may be written as र् i.e. समर्थ for समर्थ.

3. Five nasals ङ ञ ण न म may be dropped.

4. Full *anuswār* may be represented by open dot such as सिव्ह and *anunāsik* by dot चांद.

5. The form of ख ध and भ may be changed to remove the confusion with रव, घ and म.

6. क्ष, त्र and ज्ञ may be written in conjunct form, i.e. क्ष, त्र and द्न्य, ज्यं, ग्यं.

26. Dr. Gorakha Prasad (1947)[35]

1. The *mātrās* of उ ऊ ए ऐ and अं i.e. ु, ू, े, ै, ं, may be placed after the consonant, a little on the right. The design of the *mātrā* may also be changed by making them rather straight.

2. The head-line may be dropped in 9 pt. and smaller body type.

3. The conjuncts, except those of र्, may be written by placing the consonants one after the other.

4. The conjuncts of र् may be written in the present style, i.e. प्रेम, राष्ट्र, धर्म.

27. Jagannath Joshi, Nainital (1947)[36]

1. The types in the Reformed Hindi Script will be reduced to 55 from the current requirement of 400 letters.

2. By placing a decimal before a consonant it will be read as half ड and ढ, preceded by decimal will be read as ड़ and ढ़. . will represent half न i.e. nasal.

3. The numerals shall be in the international forms 1, 2, 3, 4, 5, 6, 7, 8, 9, 10.

4. The script for typing corresponds to the letters proposed for print. There will be saving of space as there are no ascenders and descenders. However the vowel-signs are placed after the consonants.

5. The script for writing and hand drawn litho work remains the same.

१	्क	ंदन	ल.का	म्०	रामच.दत्र	न्सुगव्व
१	एक	दिन	लंका	में	रामचंद्र	ने सुग्रीव
२	स्	कहा	था	ब.धु	भरत	क् समान
२	से	कहा	था,	बंधु	भरत	के समान
३	भा=	स	सं.सार	म०	कहा०	मल् गा ?
३	भाई	इस	संसार	में	कहाँ	मिलेगा ?

क	ख	ग	घ	ङ
च	छ	ज	झ	ञ
ट	ठ	ड	ढ	ण
त	थ	द	ध	न
प	फ	ब	भ	म
य	र	ल	व	श
ष	स	ह	क्ष	ज्ञ
क़	ख़	ग़	ज़	फ़
ऋ	ॅ	ॉ	ं	ः
अ	ा	ि	ी	ु
ू	े	ै	ो	ौ

ऋ— अर्द्ध र जैसे चन्द्र
ॅ— अर्द्ध अ जैसे सर्प
ॉ— अर्द्ध ऋ जैसे मृग
ं— अंग्रेजी ओ जैसे Stop.
ः— अः जैसे शान्ति :
अ— जैसे अमरुद
ा— आ जैसे आम
ि— इ जैसे इमली, दिवाली
ी— ई जैसे ईख, दीवार
ु— उ जैसे उपवास, पुराना
ू— ऊ जैसे ऊन, शूर
े— ए जैसे सेर
ै— ऐ जैसे ऐनक, सैनिक
ो— ओ जैसे ओझा, बोझा
ौ— औ जैसे औरत, दौलत

Fig. 162. New System of Lettering suggested by Jagannath Joshi.

28. Harimohanlal Shrivastav, M. A. Lt., Sahityaratna[37]

Bharatiya Lipi

Vowels

अ आ इ ई उ ऊ ए ऐ ओ औ अं अः अ्

Vowel-signs

ा ि ी ु ू े ै ो ौ ं ः ्

Consonants

क	ख	ग	घ	ङ		च	छ	ज	झ	ञ
क्‍	क्‍ख	ग्‍	ग्‍घ	ङ्‍म		च्‍	च्‍क	ज्‍	ज्‍झ	ञ्‍व
ट	ठ	ड	ढ	ण		त	थ	द	ध	न
ट्‍	ट्‍क	ड्‍	ड्‍ढ	ट्‍ट		त्‍	न्‍क	द	द्‍ध	न्‍न
प	फ	ब	भ	म		य	र	ल	व	श
प्‍	फ्‍	ब्‍	भ्‍म	म		य्‍	त्र	ल्‍	व्‍	श्‍र
ष	स	ह	क्ष	त्र		ज्ञ				
ष्‍	स्‍	ह्‍	क्ष्‍	त्र		ज्ञ				

Other phonemes

क़ ख़ ग़ ज़ (z) zh ड़ ढ़ फ़ (F) ल़

ज़. ड. (अक्षर के बाद) ल.

क्ष. (अक्षर के बाद नीचे की ओर)

W X

क वस्‍क

a जैसे Cap में ◡ a जैसे War में ◡

Special signs.

n o b

Marks of punctuation

। , ‚ ? ! ; “ ”) s — — = = *

Numerals

+ × ÷ ˚ ( ) { } [ ] – ^ < >

० १ २ ३ ४ ५ ६ ७ ८ ९

Fig. 163. **Devanagari Script suggested by Harimohan Shrivastav.**

29. Navanagari[38]

Table 82.—Navanagari alphabet.

Vowels	अ	आ	इ	इा	उ	उा	ऋ	ए	एा	उ	उा	अं	अः
Consonants	क	ग	ङ		च	ज	ञ		ट	ठ	ण		
	त	द	न		प	ब	म						
	य	र	ल	व	श	ष	स	ह					
Barakhadi	कअ	कआ	कइ	कइा	कउ	कउा	कऋ	कए	कएा	कउ	कउा	कअं	कः
	क	का	कि	की	कु	कू	कृ	के	कै	को	कौ	कं	कः

Comparison of the suggested graphemes

Devanagari	ई	ऊ	ऌ	ऐ	ओ	औ					
Navanagari	इा	उा	लऋ	एा	उ	उा					
Devanagari	ख	घ	छ	झ	ठ	ढ	थ	ध	फ	भ	श
Navanagari	कह	गह	चह	जह	टह	डह	तह	दह	पह	बह	ह

30. Dr. Dhirendra Varma[39]

International phonetic script

अA	आa:	इi	ईi:	उu	ऊu:
ऐe:	ऐAe	ओo:	औAo		
कk	खkh	गg	घgR	ङ्ŋ	
चc	छch	जJ	झJR	ञɲ	
टt	ठth	डd	ढdR	णɳ	
तt	थth	दd	धdR	नn	
पp	फph	बb	भbR	मm	
यj	रr	लl	वv		
शʃ	षʂ	सs	हR		
ड़ɾ	ढ़ɾR	·m	:h	± ~	

Fig. 164. **Phonetic Script suggested by Dr. Dhirendra Varma.**

31. Motilal Gurtu[40]

Gurtu submitted his scheme of *Vishva Lipi* to the Narendra Deo Committee. Gurtu claims that all the languages in the world can be

written with twenty letters (*sanket*). The script suggested by Gurtu which is reproduced below is altogether different from the current Devanagari.

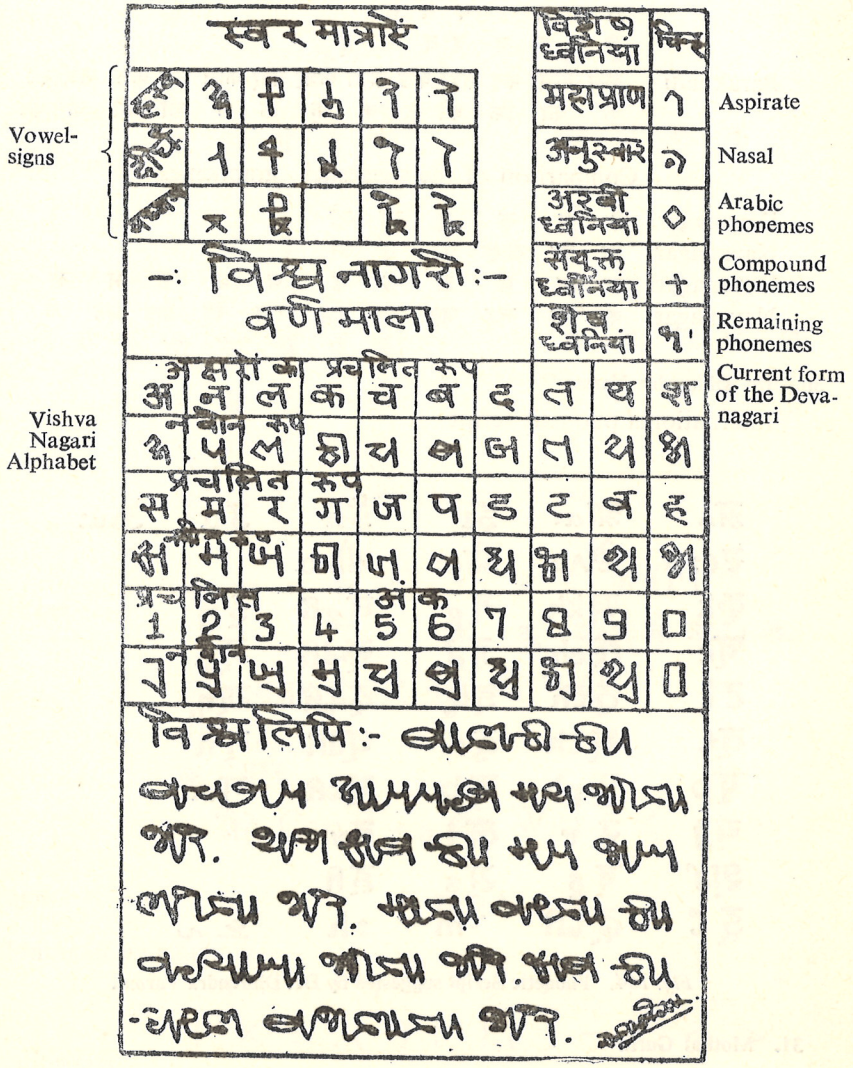


Fig. 165. **Vishva Nagari suggested by Gurtu**

The Vishva Nagari is commented upon in the HSST Standardisation Committee Report[41] as under :

" Gurtu claims that there can be one language for the whole world and this can be written in a basic script that shall be the language of the world. We are not concerning ourselves with his ideas of World Script but we would give below his ideas about the *Vishva Nagari.*

He thinks that the following changes must be effected in Devanagari in order to enable it to maintain its existence in a progressive world :

(*a*) There should be only one basic vowel-indicator उ and all the vowels must be indicated by giving proper vowel-marks to this basic vowel-indicator.

(*b*) All the vowel-marks should be made to fall to the right side of the letter and not above, below or before it.

(*c*) The *Māhaprān* consonants must be indicated by giving the ह at their end, for this is the mark which converts प into फ and can therefore be said to be the basic symbol that converts a *non-Mahāprān* to *Mahāprān.*

(*d*) He also suggests a change in the shape of the letters so as to make them more fit for printing purposes.

As a result of his proposals he thinks that the total number of letters in the Devanagari script would be reduced to twenty in all and thus Devanagari would become very suitable for all the languages of India."

32. Kamata Prasad Sagariya (1947)[42]

1. In a note prepared for wide publication, K. P. Sagariya states :

(1) To reduce the number of types it is necessary to alter the forms of certain letters and to adopt certain conventions for combining the various letters.

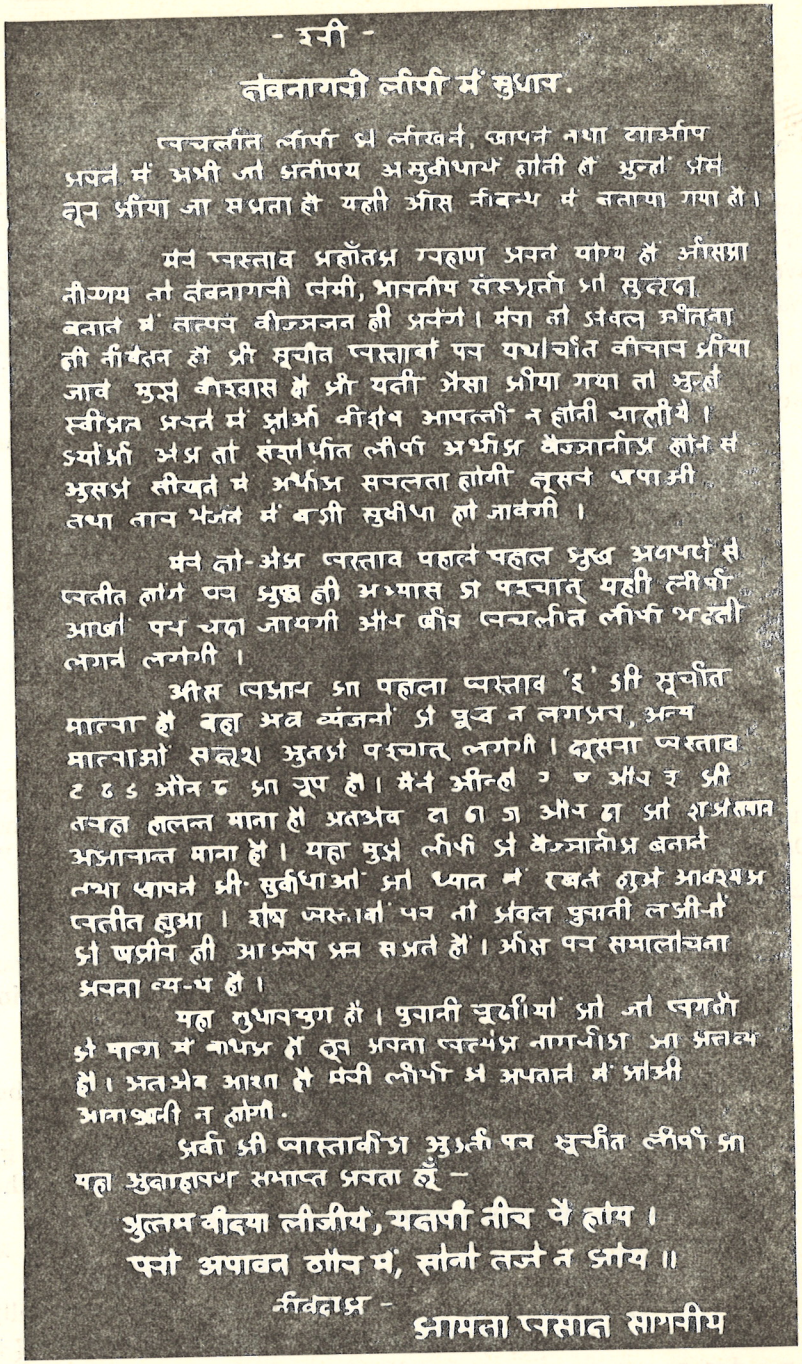
(2) There is no basic form common to all the vowels.

(3) *Mātrās* are not suffixed to the *aswara* (consonant-ending) but added above-and-before, below, or above-and-after.

(4) There is no *aswara* form of consonants ङ, छ्, ट्, ठ्, ड्, ढ्, द् and ह्. They are formed by adding a special sign called *halant* to the *akārānta* (ending with vowel अ) form.

(5) The letter र undergoes complete transformation as in क्र, प्र, र्क, ष्ट्र, च्र etc.

(6) Prefixing of the *mātrā* to the *akārānta* from is phonetically incorrect and is very confusing to a compositor, i.e. प्रि = इ+प्+र = f c ɾ.



- इनी -

देवनागरी लीपी में सुधार.

प्रचलीत लीपी में लीखने, छापने तथा टाईप
अपने में अभी जो अनीपय असुवीधायें होती हैं मुख्य उस
दूर कीया जा सकता है यही इस निबन्ध में बताया गया है।

मेरे प्रस्ताव प्रहाँतक ग्रहण करने योग्य हैं इसका
निर्णय तो देवनागरी प्रेमी, भाषातीय संस्कृति का सुदरता
बनाने में तत्पर वीद्वजन ही करेंगे। मेरा तो केवल नम्रता
ही निवेदन है की सूचीत प्रस्तावों पर यथोचीत वीचार कीया
जावे मुझे वीश्वास है की यदी ऐसा कीया गया तो मुख्य
स्वीकृत करने में ज्यादा वीशेष आपत्ती न होनी चाहीये।
इसकी से मेरा तो संशोधीत लीपी अधीक वैज्ञानीक ढंग से
मुसज्ज सीखने में अधीक सफलता होगी मूसके छपाई
तथा तार भेजने में बडी सुवीधा हो जावेगी।

मेरे तो-मेरे प्रस्ताव पहले पहल मुझ अल्पज्ञ से
प्रतीत होने पर मुझे ही अभ्यास का पश्चात् यही लीपी
आज पर चढा जायगी और वीश्व प्रचलीत लीपी बदली
लगने लगेगी।

मेरे इस लेख का पहला प्रस्ताव 'इ' की सूचीत
मात्रा है वह अब व्यंजनों के पूर्व न लगकर, अन्य
मात्राओं सदृश्य अुनके पश्चात् लगेगी। दूसरा प्रस्ताव
ट ठ ड और ढ का दूर है। मैंने अीन्हें ण् च् और ऋ की
तरह हलन्त माना है अतएव ट ठ ड और ढ को शब्दान्त
अक्षरान्त माना है। यह मुझे लीपी को वैज्ञानीक बनाने
तथा छापने की सुवीधाओं को ध्यान में रखते हुये आवश्यक
प्रतीत हुआ। शेष प्रस्तावों पर तो केवल पुरानी लकीरों
को छोडने की आदत ही आक्षेप कर सकते हैं। मेरे पर समालोचना
अपना व्यक्त करें।

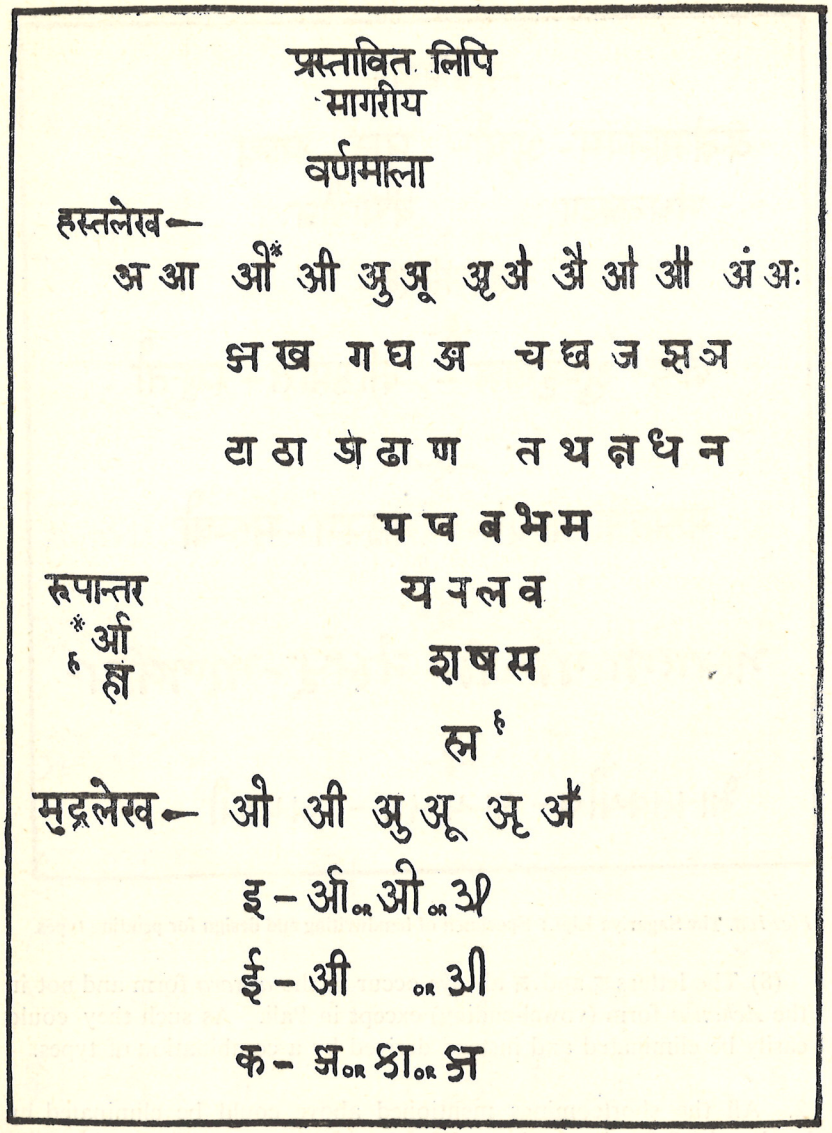
यह सुधारयुग है। पुरानी रूढीयों को जो प्रगती
के मार्ग में बाधक हैं दूर करना प्रत्येक नागरीक का कर्तव्य
है। अतएव आशा है मेरी लीपी के अपनाने में कोई
आनाकानी न होगी.

अपनी इस प्रास्ताविक अुक्ती पर सूचीत लीपी का
यह अुदाहरण समाप्त करता हूँ -

अुत्तम वीद्या लीजीये, यदपी नीच पै होय।
पडो अपावन ठौर में, सोना तजे न कोय॥

निवेदक -
आमला प्रसाद सागरीय

Fig. 166. **Reforms suggested by Sagariya**[43]



प्रस्तावित लिपि
सागरीय
वर्णमाला

हस्तलेख—
अ आ ऑ* ओ अु अू अृ अॅ ऐ ओ औ अं अः
झ ख ग घ ञ च छ ज झ ञ
ट ठ ड ढ ण त थ द ध न
प फ ब भ म
रूपान्तर य र ल व
*ऑ श ष स
ह ह

मुद्रलेख— ऑ ओ अु अू अृ अॅ
इ - ऑ or ओ or अि
ई - ओ or औ
क - झ or ञा or ञ

Fig. 167. **The Sagariya Lipi : Alphabet**

(7) The aspirated consonants ख, घ, छ etc. are not derivable from the corresponding unaspirated consonants क, ग, च etc., as is the case in English where क is *k* and ख is *kh* etc.

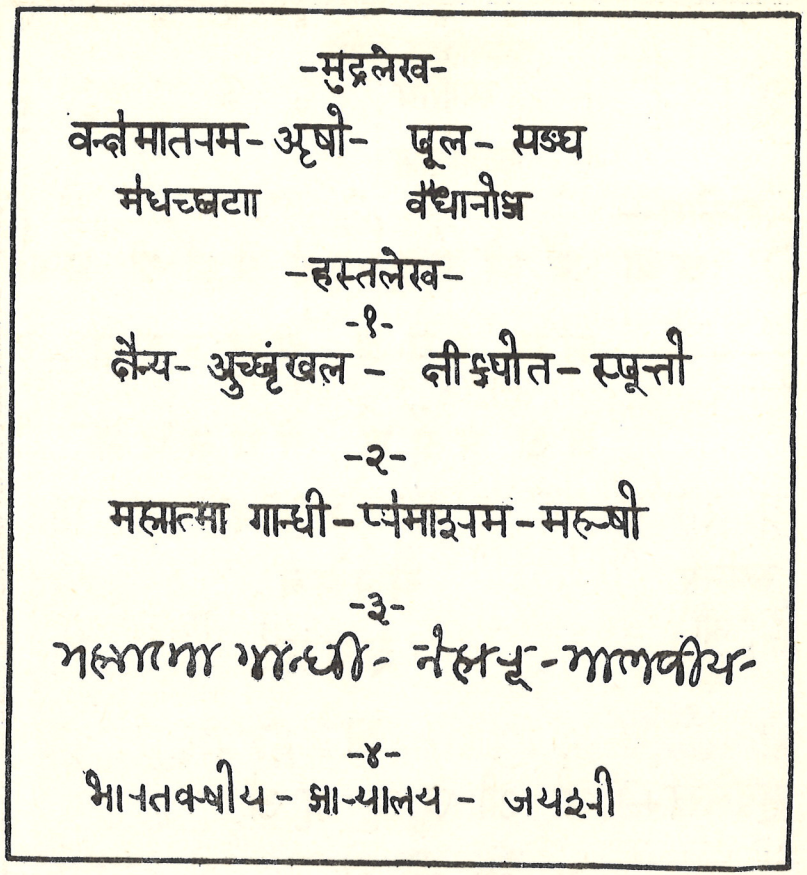


Fig. 168. **The Sagariya Lipi : Specimen of handwriting and design for printing types**

(8) The letters ङ and ञ always occur in the *aswara* form and not in the *Achanta* form (vowel-ending) except in Pali. As such they could easily be eliminated and instead derived by a combination of types.

2. All the shortcomings mentioned above could be eliminated by adopting the following basic modifications and conventions :

(*a*) The Marathi अ (or better still य which is simpler) without the end stroke, should be used as the basic form for deriving the vowels by suffixing to it modified *mātrās*.

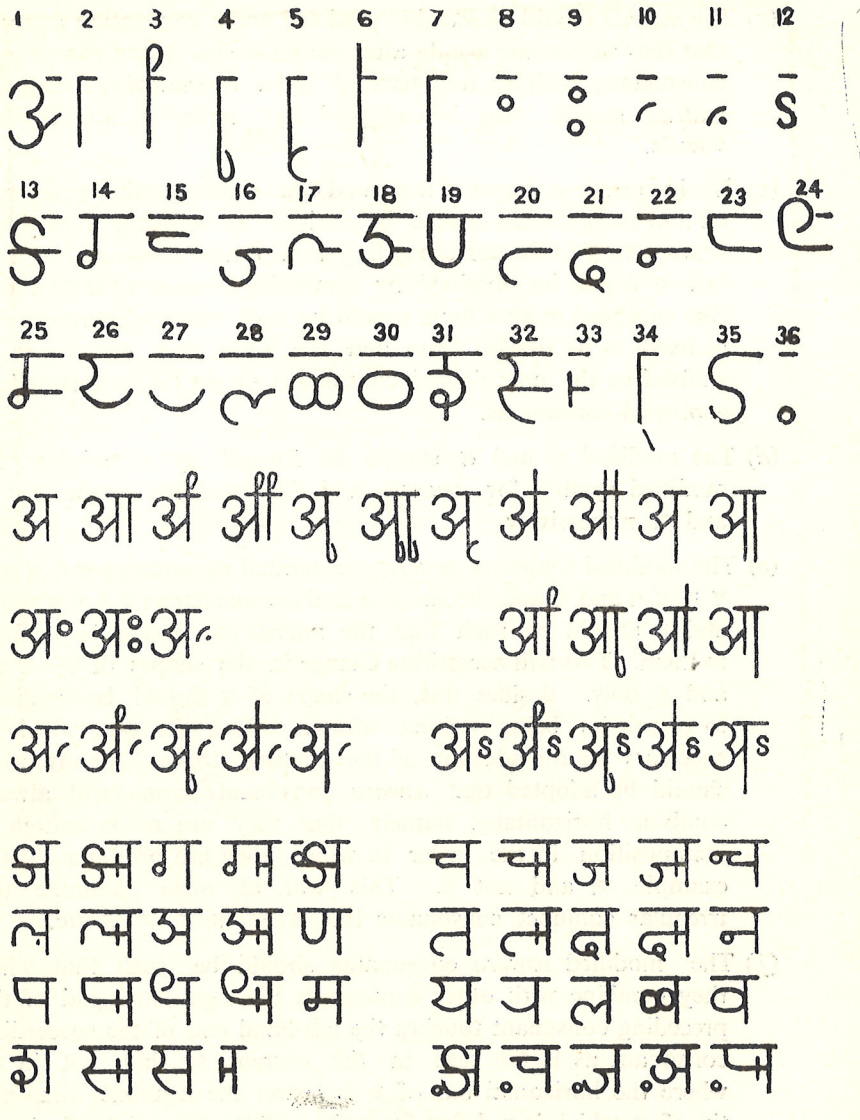


Fig. 169. **The Sagariya Lipi: Print Script A: 36 types**

(*b*) The *mātrās* should be suitably modified and a convention adopted that they shall come wholly after the strokeless अ and the *aswara* consonants, without any part of them overhanging. Suitable *mātrās* should also be adopted for depicting non-Sanskrit vowels.

(*c*) The independent shapes of aspirated consonants should be eliminated and these should instead be derived by suffixing a modified symbol for ह् to the corresponding un-aspirated consonants. Similarly ष should be obtained by combining *aswara* स (or श) and ह्. The modified symbol for ह् should be such that the *mātrās* can be suffixed to its *aswara* form and the latter itself can be easily suffixed to the unaspirated consonants to get the corresponding aspirated consonants.

(*d*) The modified ङ and ञ should be formed by combining the modified symbol for *anuswār* and the modified symbol for क and च respectively.

(*e*) The modified shapes of *aswara* unaspirated consonants क ग च ज ट ड त द प and ब and the *antastha* and *ooshma* letters य र ल व श ष स and ह should be such that the *mātrās* can always be suffixed to them. This will necessitate change in the shapes of क ट ड द र and ह only. Besides this, the shape of ब should be modified to permit its being written without lifting the pen which is necessary for the addition of the slanting stroke. A convention should be adopted that *aswara* consonant forms will always combine horizontally, namely, that they are to be written in juxtaposition in the order in which they are pronounced, for example प्त and not प्त. This will at once eliminate the irregular conjunct consonants like क्र, क्त, क्क, ट्र, श्र, क्ष etc.

(*f*) The modified *aswara* consonants should be such that when they combine with other consonants the right-hand end of the preceding consonant touches the left-hand end of the succeeding consonant as is the case in the current प्य but not in ज्य where the horizontal bar of ज is nearer the headline than the tip of य which is a defect from the calligraphic point of view.

(*g*) Suitable symbols or combinations of symbols should be adopted for non-Sanskrit consonants such as the Persian *q*, the Marathi *ch* and *zh* and the Tamil trilled and somewhat aspirated *r*. The present convention in Hindi of placing a dot below certain letters

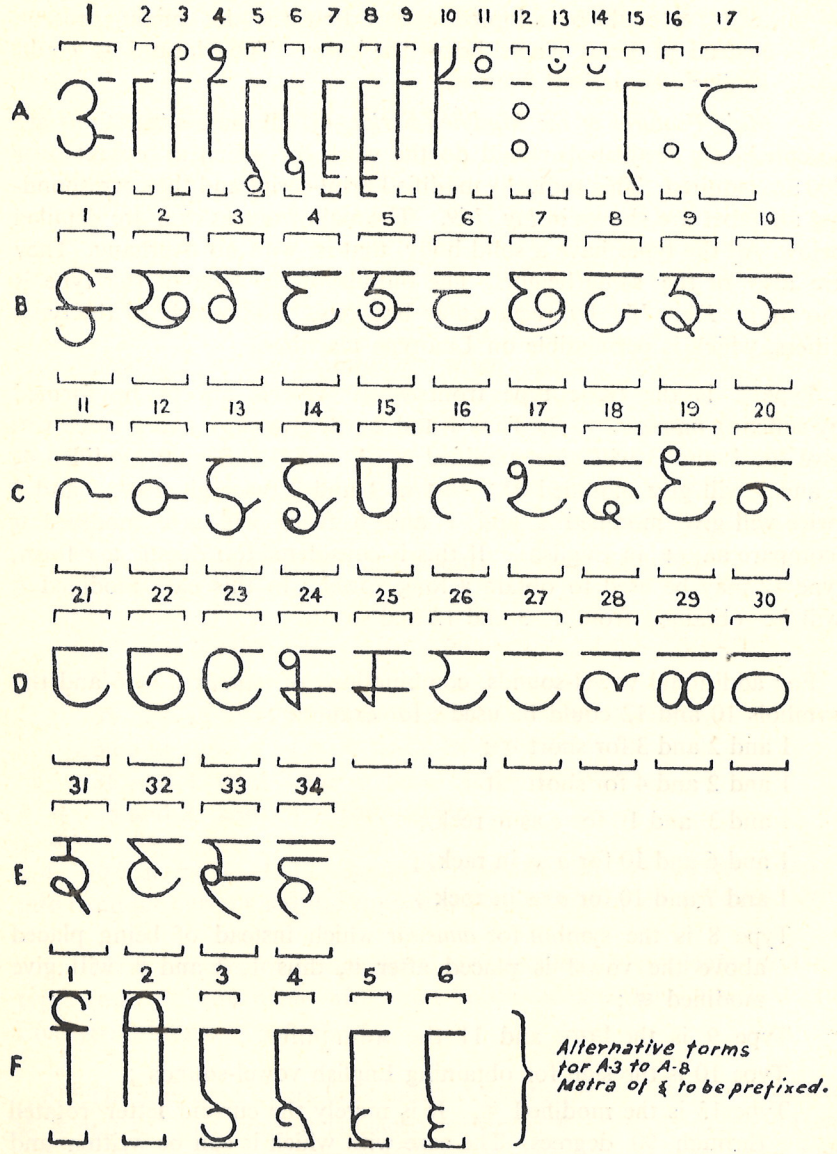


Fig. 170. **The Sagariya Lipi: Print Script B: 51 types**

as क़ ड़ could be adopted except that the dot might precede instead of being placed below the letter. The Marathi ळ could similarly be derived from ल.

3. *Main Features of the Modified Script.*—If all these suggestions are accepted only 36 symbols would do the work for which at present over 200 are required. This radically modified Print-script and the corresponding alphabet are shown in *Fig. 169*. The main features of it are detailed below. All the types have a solid body, that is, with no overhang. They are also of the same height. The outline of the face of the type is shown in *Fig. 170* by rectangular brackets. The width of the types differs, which is permissible on Linotype machines.

Type 1 is the basic type from which vowels are to be formed by suffixing *mātrās* 2 to 7. Thus 1 and 2 will give अ, 1 and 2 twice will give आ, 1 and 3 will give modified इ. 1 and 6 will give modified ए, 1 and 7 will give modified ओ. Just as 1 and 2 twice gives आ, 1 and 3 twice will give modified ई and 1 and 6 twice will give modified ऐ (compare aa, ee in English). If this is considered too drastic a reform, type 12 may be used to obtain a long vowel. In this case modified ई will be obtained from 1, 3 and 12 and so on.

For additional vowel-sounds, combinations of *mātrās* 2 to 6 and the symbols 10 and 12 could be used ; for example :

1 and 2 and 3 for short ए ;

1 and 2 and 4 for short ओ ;

1 and 3 and 10 for *e* as in reck ;

1 and 6 and 10 for *a* as in rack, ;

1 and 7 and 10 for *o* as in rock ;

Type 8 is the symbol for *anuswār* which instead of being placed above the vowel is placed after it, thus 1, 2 and 8 will give modified अ ;

Type 9 is the विसर्ग and 11 the अर्धसानुनासिक ;

Type 10 is the sign for obtaining English vowel-sounds ;

Type 13 is the modified क. It is merely the current letter rotated through 90 degrees. The ease with which it can be written and its artistic shape will be readily appreciated ;

Type 17 is the modified ट formed by rotating the current letter ;

Type 18 is the modified ड;

Type 21 is the modified द to which the various *mātrās* can be suffixed ;

Type 24 is the modified ब which is derived from प and is easily written without lifting the pen ;

Type 27 is modified र. This is the form that was current till the thirteenth century. It will eliminate the awkward transformations of the letter as in र्क, प्र, ट्र etc. ;

Type 33 is the modified ह् which when suffixed to the unaspirated letters will give the corresponding aspirated ;
[Thus 13 and 33 will give modified ख, 32 and 33 will give modified ष. In manuscript when writing modified ख either the bar of modified क be lengthened and then cut with a vertical stroke (compare 1 and 2 in English) or else the vertical stroke may be made along with the horizontal bar of modified क as shown in *Fig. 172*, line 4, symbol 5.]

Type 34 is the sign of *halant* so often needed in writing Sanskrit ;
[Thus modified द will be obtained from 21 and 34.]

Type 35 is the sign of *avagraha* used in Sanskrit ;

Type 36 is the dot which is to be prefixed to get non-Sanskrit sounds thus :

36 and 18 and 2 for modified ड़ as in बड़ा (Hindi).
36 and 15 and 2 for च as in चांगला (Marathi).
36 and 13 and 2 for क as in कायदा (Urdu).
36 and 27 and 2 for Tamil trilled *r*.

4. *Printscript-B.*—If Printscript-A is considered too radical a departure from the current script, Printscript-B may be adopted. (*See Fig. 170*).

5. Main features of Printscript-B are detailed below. Here also the types (now 51) are made with solid body and are thus adaptable for Linotype printing.

6. The aspirated letters have independent forms as also the modified ङ, ञ and ष. The *anuswār* is placed above the headline as in the current script. The *mātrās* have remained practically unchanged except that they are all to be suffixed to *aswara* consonant always. The only letters of which the shapes have been modified are क ख ट ठ ड ढ द फ ब र श and ह. These changes will be readily appreciated.

A. जय ॠस्ण्णायनञाय,तुलसंः ॾं अवताय तुम ।
ञयनं यास्त्प्रद्धाय,ममाज्ञाव्य र्नंम्मंत ॾंया ॥
ॠस्ण्ण-चर्यंत्य अपाय,पद्यपद्धम अंञत्य ञय ।
ॾंया अर्मंत अुपञाय, मंन्द्रुः मंन्दीः मंन्द पय ॥
-सागर्यंय

B. जय ॠष्णायनञाय,तुलसीॾं अवताय तुम ।
ञयनं यास्त्प्रांद्धाय,महाज्ञाव्य र्निम्मत ञिया ॥
ॠष्ण-चरित्य अपाय, पद्यपद्धं अंञत्य ञय ।
ञिया अमित अुपञाय, हिन्द्रू हिन्दी हिन्द पय ॥
-सागरीय

C. जय कृष्णायनकार, तुलसी के अवतार तुम ।
करने राष्ट्रोद्धार, महाकाव्य निर्मित किया ॥
कृष्ण-चरित्र अपार, पद्यबद्ध एकत्र कर ।
किया अमित उपकार, हिन्दू हिन्दी हिन्द पर ॥
-सागरीय

Fig. 171. **Specimen setting in the Sagariya type**

7. If even the convention regarding *mātrās* is considered too radical a change, the *mātrās* shown against F in *Fig. 170* may be adopted and as at present the *mātrā* of इ may be prefixed to the form of consonants. Even so the modified script will be adaptable for Linotype printing.

8. Specimen of modified script is given in *Fig. 171*, where C is written in the current script, B is written in Printscript-B and A is written in Printscript-A.

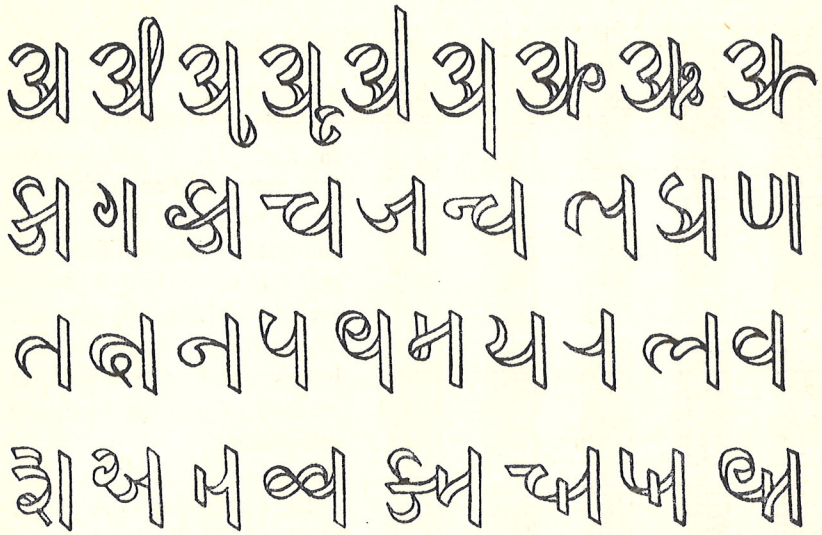


Fig. 172. **The Sagariya Lipi : Manuscript**

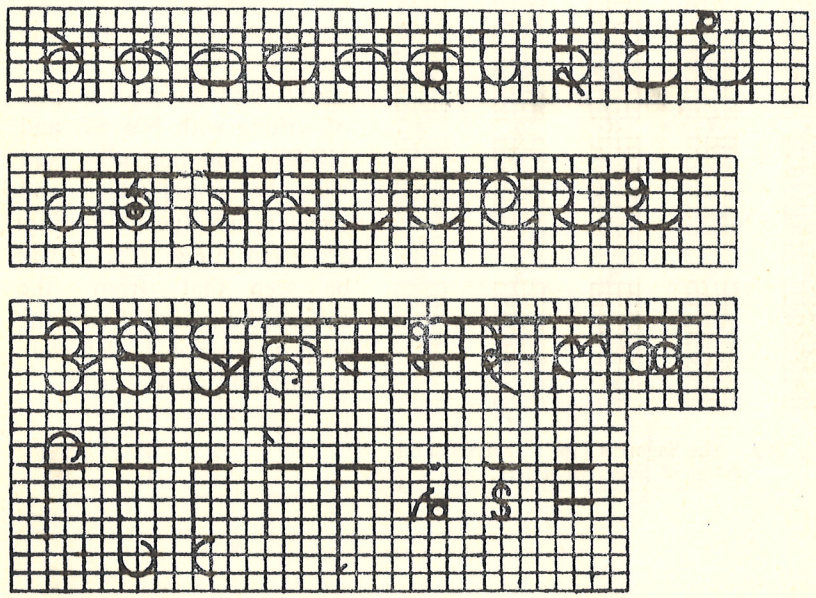


Fig. 173. **The Sagariya Lipi : Calligraphy**

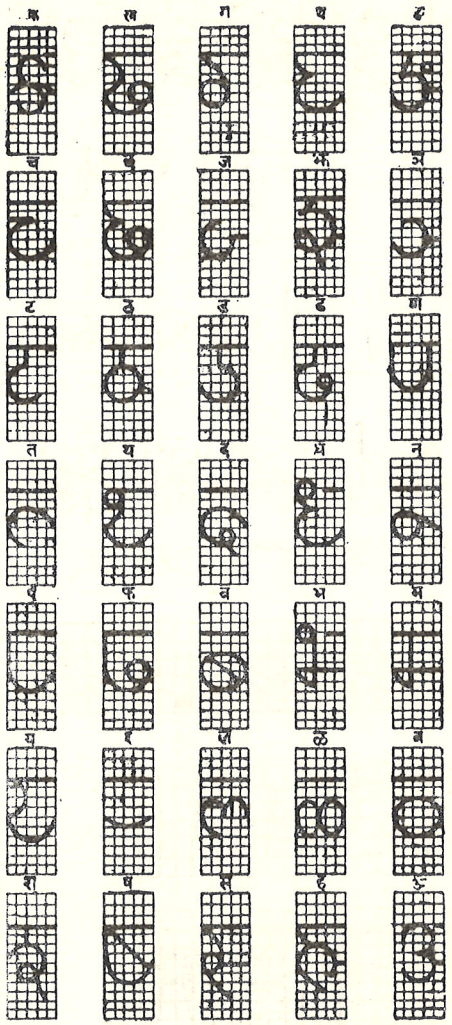


Fig. 174. **The Sagariya Lipi : Analysis of the design of Sagariya letters**

9. *Manuscript.*—How the proposed Printscript-A should be written is shown in *Fig. 172.* It will be seen that the modified script can be written more or less continuously without lifting the pen any more than is necessary in writing, say English. The artistic shape of the letters and the uniform method of writing them are self-evident.

10. *Calligraphy.*—A glance at *Fig. 173* will show how the various types are to be drawn geometrically. These are line-diagrams. The actual appearance of the letters will depend on the kind of nib used to write them. Examples of writing with NW-SE and NE-SW slanting nibs and with horizontally held and circular nibs (pencil writing) are given in *Fig. 176.* It will be seen that from the calligraphic point of view the proposed script is definitely simpler and more artistic.

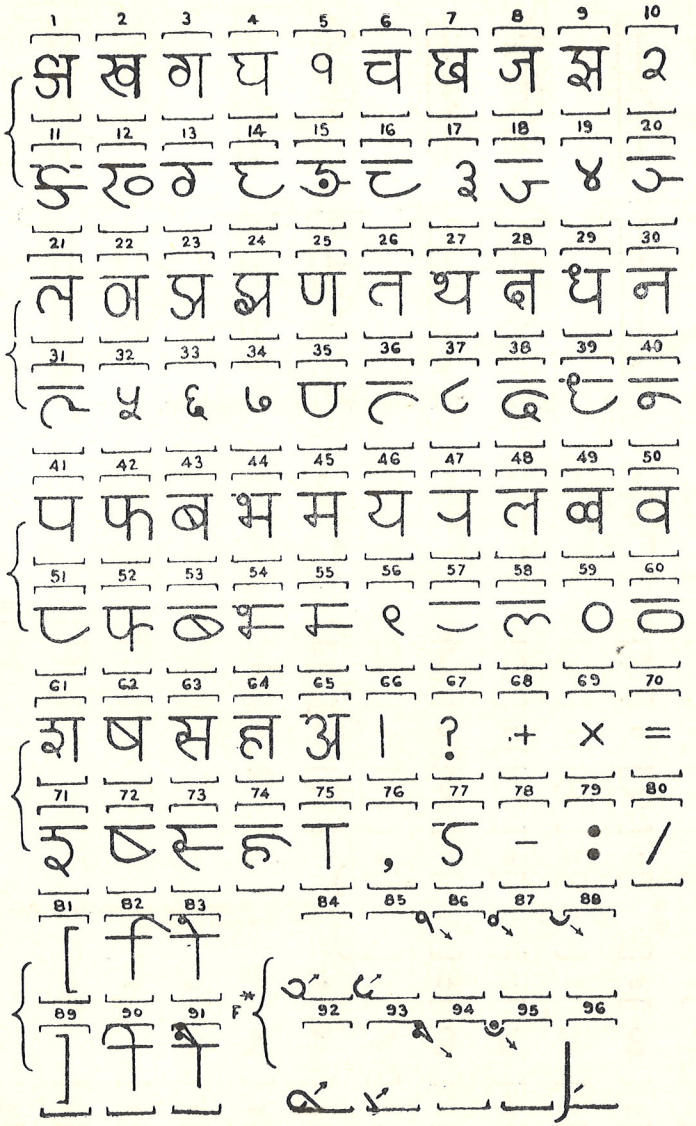


Fig. 175. **The Sagariya Lipi : Type script B—48 keys**

Fig. 176. **The Sagariya Lipi : Calligraphy.**

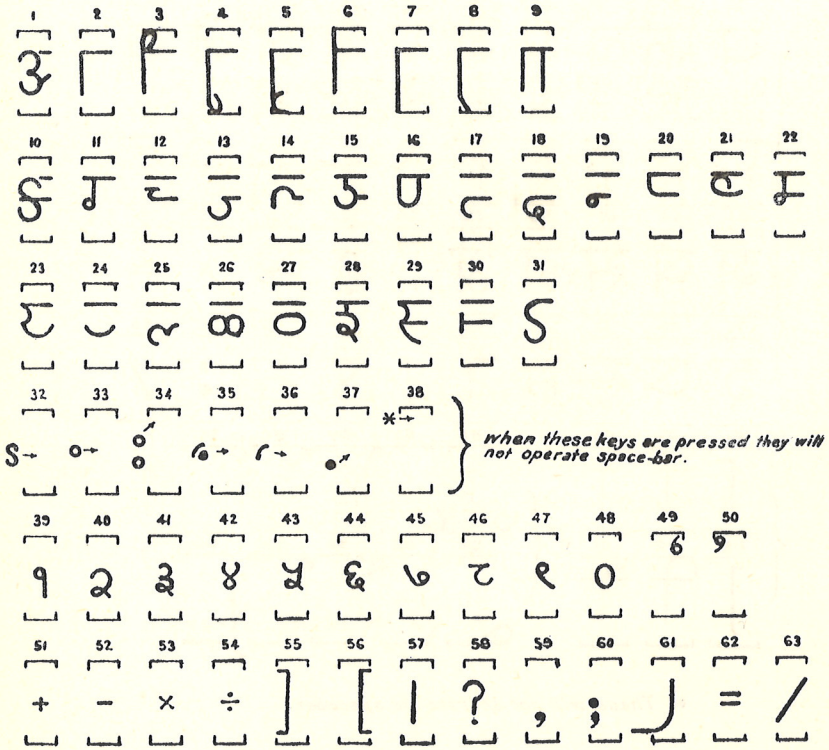


Fig. 177. **The Sagariya Lipi : Type script. A—63 types**

Other reformed scripts reproduced in the appendices to the *Narendra Dev Committee Report* and referred to at para 3, page 45 of the main report are shown hereunder for easy reference.

33. Alphabet क.[44]

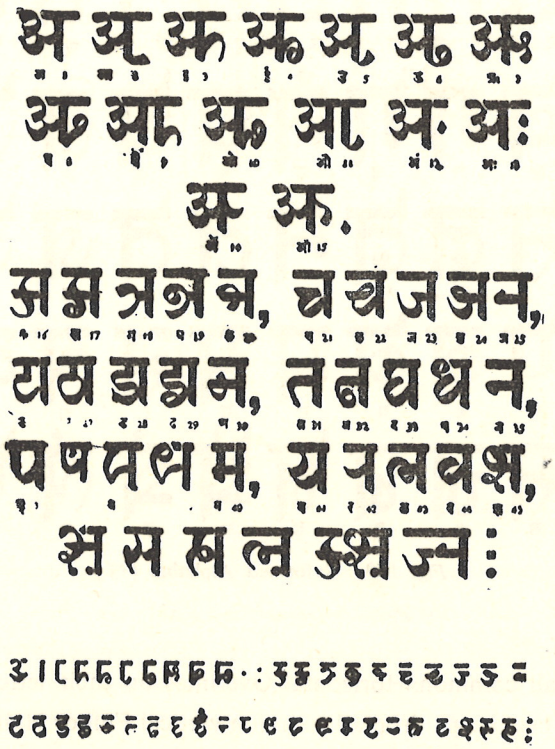


Fig. 178. **Reformed Alphabet (क).**

34. Alphabet ख.[45]

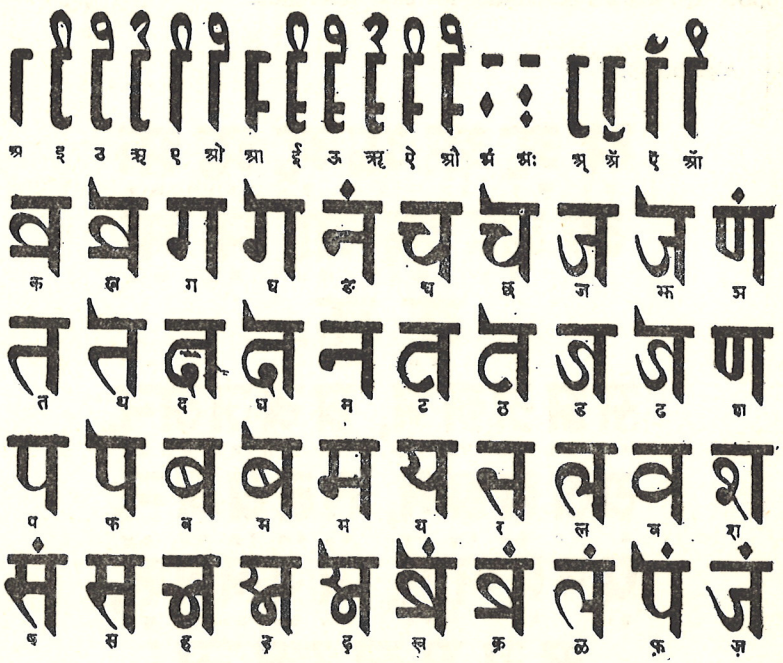


Fig. 179. **Reformed Alphabet (ख)**

35. Script ग. [46]

I. Drop all common Horizontal Overlines on each letter.

II. In the next stage, drop all common vertical Full or Half strokes.

III. Equivalents from other Language Alphabets have been taken at some places for better form.

IV. Vowels have been formed by adding the present vowel-signs to a very convenient common base o.

Vowels

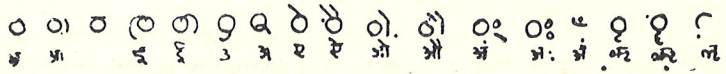


Fig. 180. **Vowels in Script ग**

CONSONANTS

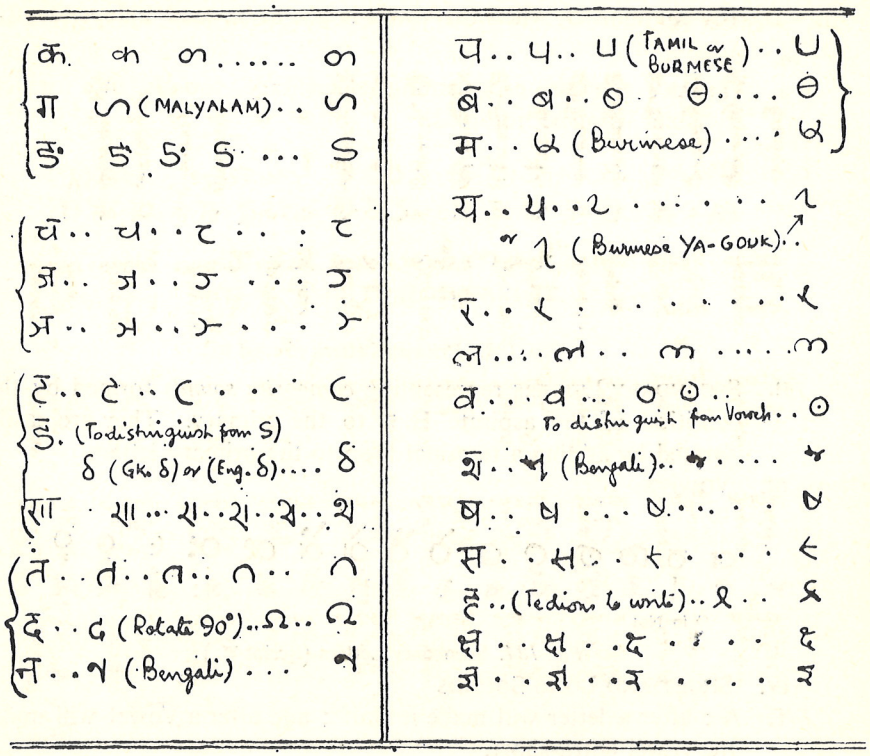


Fig. 181. **Consonants in Script ग.**

Here, in reality two forms of scripts are suggested (*i*) by dropping common horizontal strokes only and (*ii*) by dropping common vertical strokes also.

The ultimate or penultimate forms may be taken up.

V. For composite sounds like ख formed by the addition of the aspirate ह to the primary sounds, add a terminal loop. Thus :

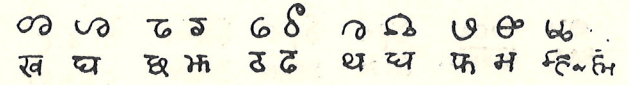


Fig. 182. **Graphemes for composite sounds**

VI. For Soft sounds of vowels or consonants add a : , to follow.

VII. For Extra-Long sounds of vowels or consonants add a २ to follow. This doubles the sound.

VIII. In writing, the vowels will have the symbols formed by dropping the common O, when the vowel is not to be read independently.

36. Script घ.[47]

I. PRIMARY LETTERS representing elementary sounds into which syllables can be resolved.

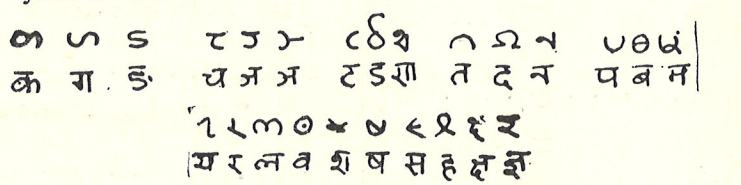


Fig. 183. **Primary Letters (Script घ.)**

II. SECONDARY LETTERS representing *composite sounds* formed by the addition of the aspirate H ह to the primary. They are easily formed by adding a terminal loop to the primary letters.

III. VOWELS

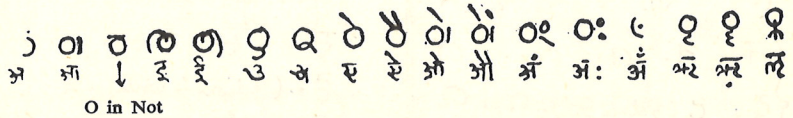


Fig. 184. **Secondary Letters (Script घ.)**

IV. SHORT AND LONG SOUNDS

1. A : after a letter will make it Half ; and after a Vowel will make the vowel Ultra-short.
2. A 2 (Small २ or Double दूना) will placed after a Letter double the letter ; and placed after a Vowel make the Vowel Extra-long.

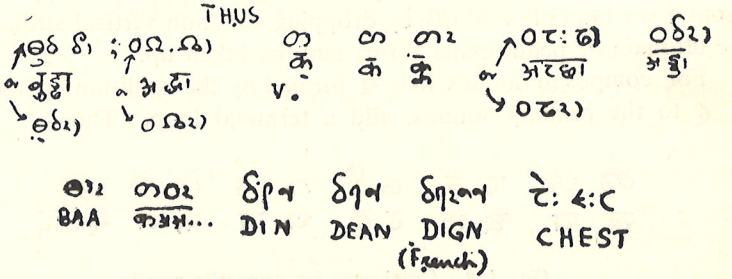


Fig. 185. **Short and Long Sounds (Script घ.)**

V. VOWEL SYMBOLS

1. In cursive form, the diacritical marks used at present will continue. But the sign of (इ) i.e. (ि) will not be put before a consonant ;

it will be put after the consonant, which is the correct phonetic way of putting it.

These signs are obtained by dropping the common o (अ) from the above proposed vowels.

2. In typewriting, the vowels will have no representative symbols. They will be used as a whole, after the consonants, as in the European languages with the rule that no vowel will read independently (*i*) unless it begins a word or (*ii*) is preceded by a vowel or (*iii*) is preceded by a hyphen (-).

In every other case, it will change the sound of the preceding consonant by being read with it. Thus in writing we have :

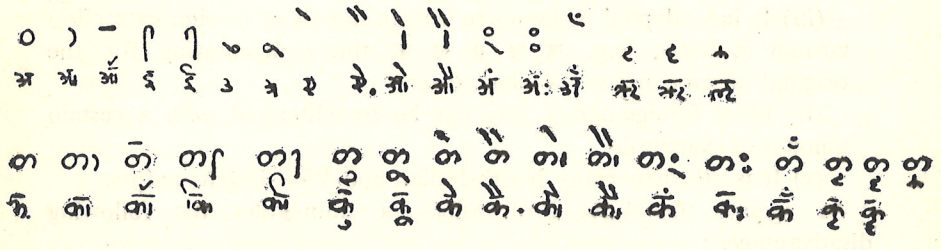


Fig. 186. **Vowel Signs and *Barakhadi* (Script घ.)**

37. Dr. M. D. Manohar.[48]

In his 'Reformed Devanagari Script' Manohar suggests that "the Devanagari script would be suitable to printing, typing and teleprinting machines if the following reforms are effected in it" :

(*a*) The basic vowel indicator should be the symbol ऊ and different vowel-symbols should be formed by combining the distinctive vowel mark of each to it. The vowel marks are to be put after the letter. He gives in his book the different vowel marks that are to be added to this indicator.

(*b*) Add the short ए and short ओ vowels to the Devanagari script.

(*c*) Add the vertical line to all the consonant letters which do not have the vertical line at the end.

(*d*) Represent *mahāprāṇa* by adding a small circle to the *non-mahāprāṇa* consonants of each group. This circle may be added below or above the particular letter. Thus थ would be written as न.

(*e*) Write क्ष by the combination of क and ष.

(*f*) Change the form of क फ झ and ङ in order to put the vertical line at the end.

Manohar thinks that with these changes in Devanagari script, the script would be printed without any difficulty whatsoever.

38. Prof. H. K. Sherwani of Hyderabad (1949)[49]

Sherwani issued a folder in 1949 advocating the adaptation of Roman script for Indian languages. He records the following arguments advanced in favour of the use of Devanagari :

(*i*) Devanagari is " an Indian script " ; as neo-Hindi has a tendency to become Sanskritic, the sentiment of a section of the people is in its favour.

(*ii*) It is clear in writing and clear in print.

(*iii*) It has adapted its letters to certain sounds of foreign extraction current in India, e.g. क़ ख़ ग़ ज़ फ़ thus compensating for the original discrepancies to some extent.

(*iv*) Most foreign names, etc., can be transliterated with a certain amount of exactitude.

(*v*) It is allied to many North-Indian and West-Indian scripts.

As against the above, Prof. Sherwani enumerates the following disadvantages :

(1) There are as many as 55 basic letters, and even aspirated sounds are expressed by distinct forms : e.g. aspirated ब is represented by भ .

(2) There is always an ultimate short vowel understood at the end of each consonant involving the necessity to have half-letter forms or *Sanyuktākṣaras* for unvowelled sounds.

(3) Symbols for expressing vowel-sounds are placed sometimes before, sometimes after, sometimes above and sometimes below the consonant concerned, and this technique is obviously unsuited for quick printing and typing.

(4) Writing is fairly complicated and even some of the simplest sounds are sometimes expressed by letters of multiple strokes (such as आ with 5 or 6 strokes for perhaps the simplest sound in any language), while some of the cursives are quite complicated, e.g. छ, झ, ह, क्ष ज्ञ. The adoption of Hindi script for the National Language would therefore greatly increase not only the paper space but also the comparative time needed to get through a work.

(5) The script is current only in parts of the North and is not acceptable to the Dravidian South and even to Western Bengal. The total number of persons using the Hindi or an allied script for their mother-tongue is not more than eighteen crores.

Prof. Sherwani therefore argues the acceptance of the Latin alphabet for the Indian Languages and states :

(*a*) Practically all current Hindi-Urdu-Hindustani sounds can be covered by the following twenty-four basic forms :

simple vowels : a, e, i, o, u.

and nineteen simple consonants : b, ch (च), d (द), f, g, h, j, k, l, m, n, p, q (क़), r, s, t (त), w, y, z.

(*b*) Long and compound vowel-sounds : aa (आ, ा), ai (ऐ), au (औ), ĕ, ï, ŏ, ou (ou in *ou*nce), uu (ऊ).

(*c*) Dotted consonants : ḍ (ड) ḥ (ह) ṛ (ड़) ṭ (ट) ṇ (ं)

(*d*) Compound consonants : gh (ग़), sh (श), kh (ख़)

(*e*) There need be no capital forms distinct from the small letters though, if it is thought desirable, it is possible that the identical forms might simply be enlarged in size (without any change in the actual shape or formation) in order to begin a sentence or proper name, such is already the case with nine out of twenty-eight letters of the English alphabet, i.e., c & C, k & K, o & O, s & S, v & V, w & W, x & X, y & Y, z & Z. The same principle might well be applied to all other letters in order to make the script still easier.

(*f*) " Of course these are mere suggestions, and the actual adaptation of the Latin script to the needs of our National Language may well be considered and effected after due deliberation by a Committee appointed by the Government of India for the purpose.

39. Buddhiraju Rajabhushana Rao (1950)[50]

The comments and suggestions of Rao are given in his own words :

1. The inconvenience of Devanagari does not lie so much in the main alphabet as in the use of the compound letters in it.

2. The consonants and vowels may therefore be written separately without being dovetailed into one another and made to appear as a single letter, which in fact it is not, we do not forego a little of the advantage enjoyed by the Roman script. For example the word हिन्द (Hind) will have to be written as हइनद.

3. The *Purṇanuswāra*, for which ' m ' is not a correct substitute and the function of which is not discharged by any of the five *anunāsika* or nasal characters in the Indian alphabet, has a distinct use of its own. No character can take the place of *purṇanuswāra* say in the writing of a word like ' संयमि ' *samyami*. Telugu expresses the *purṇanuswāra* as ' 0 ' as a suffix to the letter and it is called by a Telugu name which means a zero which it really looks. If this symbol is taken from Telugu,

it need not be separately provided because as cipher it anyhow occurs among the figures. The *visarga* that is found in Sanskrit can be represented by the colon.

4. The nasal sound which is indicated in Hindi writings by a crescent with a star over the upper horizontal stroke, is indicated in Telugu by the mark ' ◌ ' as a suffix and it is called the *ardhanuswāra*. This may be taken for Devanagari.

5. On this computation fifty-one symbols for letters and other adjuncts including the long vowel ऌ (which does not exist even in Sanskrit as *deergha* but only as *pluta*), ॡ which came into vogue at a later time, and क्ष and ज्ञ which are compound consonants.

6. Some of the special letters occurring in other alphabets may be borrowed. For instance short ए and ओ corresponding to ' o ' as in ' opinion ' the hard ' r ' ॷ called *sakata-repha*.

7. The consonants ' *f* ' and ' *z* ' and the vowel-sound represented by ' *a* ' as in ' m*a*n ', may be taken from the Roman script. ' *f* ' and ' *z* ' will represent exactly the same sounds as they do in the Latin alphabet.

8. One special letter expressing a special sound occurs in Tamil, is not expressed either by ' *j* ' or ' *z* '. It may be included in the common script.

9. The upper horizontal bar, which is the characteristic feature of the Devanagari script, may also be added to each of the characters borrowed from other languages, in order to impart to all the characters a certain kind of uniformity of appearance.

10. The letters ए and ओ will be pronounced only as short vowels ; and in order to make them long, the vertical bar (ा) will be added as suffix, i.e. एा ओा.

11. Devanagari is much broader script in writing than the Latin alphabet. The Devanagari script with the suggested changes will occupy more space and will take much longer time to write.

40. Satyendra Kumar Gupta [51]

Gupta in his ' Some suggestions for the reform of the Script ' states that, " Devanagari would become quite suitable to printing if the following reforms are accepted :

(*a*) The consonant or consonants combining with another should be written one after the other instead of above or below as is done now.

(*b*) र when it combines with other consonants is written as ɾ as is done in Marathi and when other consonants combine with it, it is written as ◌् and not ɾ ".

41. Vaman Ramkrishna [52]

Ramkrishna in his *Balbodh Lipi* suggests that the script can be made suitable for printing if the following reforms are effected in it :

(*a*) All consonants not having vertical lines at their end are given a vertical line at the end. Thus क should be written as का. In certain cases he would write the letter in a new form in order to give this vertical line at the end. Thus ट would be ट्प.

(*b*) He would like that all the vowels should be indicated by adding a vowel-mark to the basic vowel-indicator which is अ.

(*c*) The combining consonants should be written in order in which they occur. The *Rafar* ◌् should be written in its proper place of pronunciation. Thus अर्थ should be written as अ्थ.

42. Keshava Chandra Barua [53]

Barua in his *Borda's Lipi* thinks that the following reform would make the Devanagari script quite adaptable to modern means of Lithography :

(*a*) All the vowels should be indicated by giving the proper vowel-mark to the basic vowel-indicator ऊ.

(*b*) The vowel-marks should be altered so as to make them fall after the letter with which they combine.

(*c*) The consonants when they combine should base between them a *Sanyukt* sign which is ∩.

43. Hari Sharan Singh [54]

Singh thinks that the following reforms should be made in the Devanagari script :

(*a*) Short ए and ओ should be included in the Devanagari script.

(*b*) All the vowels must be indicated by putting a proper vowel-mark to the basic vowel-indicator ऊ.

(*c*) The vowel-mark for short इ should fall after the letter and not before it and should be changed a little.

(*d*) The vowel-marks for उ, ऊ and ऋ should fall a little after the letter.

44. Bansidhar Manoharlal [55]

Manoharlal suggests that " the following reform would make the Devanagari script very suitable for printing :

(*a*) All the consonants which do not have the vertical line at the end should be provided with the vertical line and if necessary the way of writing of some of these letters should be changed.

(*b*) The consonants should combine in their order of occurrence and the half-letter can be written by just omitting the vertical line which stands for the vowel."

45. Prati Sanskrit Devanagari Lipi of Shri Srinivas [56]

The scheme of Prati Sanskrit Devanagari letters suggested by Srinivas is given below :

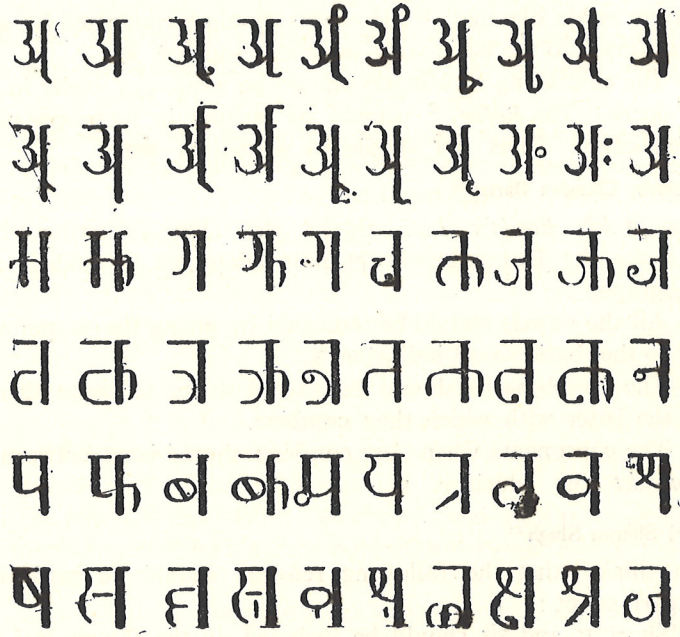


Fig. 187. **Prati Sanskrit Devanagari**

(1) The form उ which is present in अ may be accepted as a basis for forming the vowel-symbols.

(2) New symbols may be added for the phonemes—*a* in *a*t and *a* in *a*ll (short ए and short ओ).

(3) The second part of the vowel-symbol should be distinct and be considered its *mātrā*. The *mātrā* would be the vowel-symbol minus basic उ. Vowel-symbol for इ = उि and *mātrā* ि .

(4) The *mātrās* of इ and ए shall have ascenders and those of उ and ऊ shall have descenders.

(5) The presence of *halant* sign ् will denote one *mātrā* time-unit and its absence will denote two *mātrā* time-units.

(6) The letters of *Bārākhadi* may be constructed by adding the *mātrās*.

(7) The *mātrās* shall be placed after the vowels and consonants and not above, below or before them.

(8) The absence of verti-bar shall indicate pure consonant.

(9) The conjuncts shall be made by placing the consonants one after the other in the order of pronunciation.

(10) The aspirate consonants may be represented by adding the latter half of फ i.e. ऽ to the consonants, i.e. ख would be क (क) + ऽ = क ऽ क ; घ would be ग + ऽ = ग ऽ ग.

(11) The nasals ङ ञ ण may be written by adding the open dot ◦ to the third letters (ग च ट); न and म may be written by adding ◦ to first letters (त and प).

(12) क, श and र may be written as ‍क, ‍श and ‍र.

(13) The forms of ड and ह may be simplified and provided with a verti-bar.

(14) क्, ट्, ड्, द् and ह् followed by the vowel अ may be written with full verti-bar.

(15) New graphemes may be added for *f*, *zh* and *z*.

Srinivas claims that all the Indian Languages and Arabic, Persian and English can be written with twelve vowels and twenty-six consonants. *Narendra Dev Committee Report* refers to the suggestion of Srinivas that the *mātrās* of ई and ए should have ascenders while those of ऊ and ओ should have descenders.

46. Srinivas on Devanagari for Teleprinter [57]

(1) Vowels may be written with the basic vowel-sign preceding the *mātrā*. Short vowel may be typed with dead key of *halant*.

(2) The consonants may be followed by the vowel *mātrā* as in English, i.e. का = Ka.

(3) In case of the *māhāprāṇā* the dead-key of the *māhāprāṇā* may be typed after the *alpa-prāṇā* consonant.

(4) Conjuncts may be typed in order of pronunciation followed by the vowel *mātāa*, i.e. उच्छवास = उच्‌क्‌वास

(5) ङ and ञ may be represented by *anuswār*.

(6) The keys of *anunāsik*, *visarga*, *māhāprāṇā* and *halant* shall be dead.

47. C. Rajagopalachari (1953)[58]

In a letter written to late Pandit Govind Vallabh Pant, Rajagopalachari states :

"I have received some communications about a Conference you have organised for the improvement of the *Nagari* script. I know I am wholly incompetent to offer my suggestions. But even as an ignorant outsider interested in making the Hindi script easier to read for outsiders, a few thoughts strike me which I feel I may communicate to those who are engaged in the work. I thought it best to send them through you. I hope you will forgive me. You may deal with my letter as you think best.

"The printers and publishers are inclined to dominate such discussions a little too much. They are interested in reducing composing labour and easing Linotype technique. We should, however, be more concerned in making the script easier for the unpractised reader. This will serve to spread Hindi all over India more easily.

"There are some letters in *Nagari* which carry the upright stroke as a part of the letter itself. This in close printing, gets mixed up with the upright long आ vowel-stroke. This must be differentiated so as to avoid confusion and to facilitate rapid reading. ग श ण are the letters I refer to. Could they be put in the form ग्र श्र प्र so that these letters too may have the upright stroke as a conjoint part of the letter form ?

"Again the upright stroke of the short and long vowel combination of the consonants : e.g. कि, की, चि, ची, should be also slightly changed to the same end. We may in these cases have the upright stroke as below :

कि=की, चि,=ची

"The upright stroke in ि and ी need not have the same full length as the *ākār* stroke. A half stroke would quite do and will eliminate the confusion that this upright stroke in close contact with preceding and succeeding letters may cause. Similarly, we may have the upright strokes of को, कौ, etc., also as को कौ and add a small hook.

Illustrations:— अ श्रो क स्ता र प्पा स्ता र: चर्तुमनि:
श्रूर : श्रीं रि र्जं ने श्व र: प्रा प्प नि ल य:"

48. Invitees to Lucknow conference from Assam (1953)

The invitees to the Lucknow Conference from Assam submitted a joint memorandum. The points made in this document are summarised below :

Kakasaheb Kalelkar has made an attempt to reform the vowels of the existing alphabets by changing the shapes of seven vowels, i.e. इ ई उ ऊ ऋ ए ऐ and introducing new ones in their places, viz. ओ, औ अु अू अृ अे अै. All the 13 vowels of the new system as introduced by Kaka Saheb being virtually modifications of only vowel अ, it will offer obvious advantages to the new learners of Hindi.

2. Attempt should be made to simplify some of the consonants by introducing simplified forms of consonants in place of those which proved to be cumbersome to new learners. For instance, ख ण or ण, ध भ and ह. These letters can be substituted by simple ones,

1. श्न (Assamese) for ख
2. न Do. for ण ण़
3. ध for ध
4. भ for भ
5. ह (Assamese) for ह

(*i*) The suggested श्‍ for ख avoids all complications and is simpler to write and also does away with the *Shirorekhā*, which is a definite advantage.

(*ii*) The existing ण or ण़ also appears to be complicated and can be more conveniently substituted by the Assamese न which has the additional advantage of a letter without *Shirorekhā*.

(*iii*) The present form of ह is really difficult to write with two backward moves, which can be much simplified by using the Assamese ह़ in its place. This has much in common with the Hindi alphabet.

3. The compounds should be formed by placing the first letter of the compound in half, together with the second letter in full, in juxtaposition.

4. As regards *rakar* the same principle may be followed, i.e. म्र प्र ज्र,

5. The vowel sign of short ि should come after its consonant in order to facilitate forward movement and not before it, as it is now. The sign of short 'ि' should follow the consonant with a new symbol, i.e. "ि" which will surely be easier to write and can be distinguished from "ी" and "े".

49. Haranandan Prasad, Bihar (1953)[59]

1. "Reformers seeking to apply one script to the Sanskritic Languages in India have to reckon with the local patriotism of linguistic groups

who have to preserve their regional languages in their distinctive scripts. It is for consideration whether it will be politically expedient for Government to force the adoption of a common script on people intensely attached to their regional languages and scripts.

2. Script is the secondary and language is the primary element. Hindi (as national language) means a definite system of phonetics and distinct syntax. It means a vocabulary made up of the following in descending order of importance :

(1) *Tadbhava* — derived from Sanskrit words
(2) *Tatsama* — Sanskrit words themselves
(3) *Deshaj* — Indigenous words adopted from local dialects
(4) *Videshi* — Foreign words in the following order of frequency
(*i*) Persian, (*ii*) English, (*iii*) Arabic, (*iv*) Others.

(The question is whether the symbols employed in the Devanagari script are adequate to represent Hindi.)

3. Unless consciously we have taken a decision about how far we are going to change these three distinguishing features of Hindi (vocabulary, phonetics and syntax) by elimination or by borrowing or by adaptation from outside, it is illogical to think of reform in the script.

4. The Devanagari alphabet cannot convey exactly how the *Vedic* hymns have to be recited otherwise than by an accepted phonetic convention of additional accent marks which in upper India we have lost with the result that even a good Sanskrit Pandit in upper India cannot now intone the hymns.

5. Nobody disputes that *Tadbhava*, *Tatsama* and *Deshaj* words current in Hindi are adequately reproduced through the Devanagari script and the phonetical system followed in the Hindi-speaking area. There is a slight difficulty about the foreign words. Thus if we want to reproduce Persian words exactly and rely mainly not on phonetics but on symbols, we will have to find some symbols for consonants and vowels which are not to be found in *Tadbhava*, *Tatsama* and *Deshaj* words which are the main constituents of Hindi. Similarly, English words while they do not make many new demands for consonants also necessitate some new vowel-sounds.

6. It is just an artificial attempt to produce original forms and sounds when foreign words are already absorbed into native phonetics and brought into the Hindi system of pronunciation...(Such an attempt will) clutter our script with new fangled devices which are quite unnecessary and will be a psychological burden on the country. In fact the Hindi Committee of the Constituent Assembly as well as the

Committee set up by the U.P. Government have advised against multiplication of symbols.

7. Bihar Government have given a great deal of thought to this and allied matters and have come to the conclusion that the present symbols employed in the Devanagari script are adequate for our needs in so far as writing Hindi by hand is concerned.

8. The preoccupation of the reformers appears to be really whether the symbols and their combinations are also suitable for writing with mechanical devices such as by typewriters, teleprinters and for Lino and Mono composition.

9. The U.P. Committee wisely declined to accept a script which would look one thing when written by hand and another thing when printed.

10. Many languages of West and East having overlapping symbols, some of them even in larger numbers than in Hindi, have not thought of abandoning their script in favour of Roman for the supposed advantages which reformers of Hindi are seeking to derive. They have, on the other hand, adapted the machines to suit their scripts.

11. The search of reformers of Hindi should have been similarly to see *whether machines could be had to suit our script and not how we should break and mutilate our script to suit the machines* which have been manufactured for the Roman script. Only if no machine could be manufactured or adapted for the Devanagari script, should modification in our script have been considered and recommended.

12. A book written or printed in some of the reformed scripts would be as different in look as the vanished *Kharoshti* script of Sanskrit differed from *Brahmi* script of which Devanagari is a form. *If we make too great a break with our existing script, we would disinherit ourselves and all our children of all the literature printed earlier and extant at present in the hitherto current Devanagari script.* If, therefore, we want to avoid a sudden break in our cultural heritage, we have to keep our script and our way of writing as it has been with the least possible modification.

13. The second major aim is that the script should be such that in writing it whether by hand or mechanically there is as great a saving in space, that is, in paper, stationery and printing, as possible. The secret of this economy is that we have adopted as the unit of our writing a syllable rather than a letter. Thus, in Roman the smallest syllable with a consonant sound will be of two letters occupying two spaces. In Nagri it just occupies one space. A consonant combined to a consonant

gives a '*sanyuktakshara*' which is often accommodated in one space and a consonant linked with vowel symbols ि ु ृ etc., also occupies only one space, and if linked with other vowel-symbols occupies one and half space only.

14. Third major aim of script reform should be to achieve speed. To this end the number of strokes should be reduced by reducing the number of symbols and configurations used and by avoiding shifts as much as possible."

50. Dr. Kripanath Mishra's Devanagari for Hindi (1953)[60]

Dr. Kripanath Mishra, Professor in the Science College, Patna, considers Nagari a perfect script except for the following defects :

(*a*) Graphic defect : Writing of the full graphic symbol for half sound and half graphic symbol for full sound, i.e. half द् and full व in द्व or half ह् and full म in ह्म.

(*b*) Phonetic defects : No means of distinguishing the sound of vocalised middle and devocalised final न in the word मनन.

(*c*) Sequential defect : The cerebral group of consonants ट which should follow the first group of क is currently placed third.

Prof. Mishra explains the difference in Nagari and Roman, thus :

In Roman, consonants are modified by vowels which are written in full. In Nagari consonants are modified by vowels which when thus modifying consonants, are shortened into signs called *Mātrās*.

In Roman, the full vowels modifying consonants always follow consonants separately or apart ; in Nagari, the shortened vowel-signs, *Mātrās*, modifying consonants rarely precede, sometimes follow, but generally overlap or fall at the top or bottom of the consonants they modify.

Roman script has rectangular bodies and not angular bodies as Nagari script.

The problem of Nagari is to reduce the Nagari fount to about 100 pieces and to devise a method of forming, out of full basic letters, the consonants vocalised by overlapping symbols or *mātrās* which method should apply uniformly to all letters.

Dr. Mishra formulated a scheme under which the number of types is reduced considerably :

(*a*) Teleprinter 52 (*b*) Typewriter 84 (*c*) Linotype 87

"How best to break up the existing script into symbols and configurations, which should be as few as possible and which on combination, should give us the familiar form of writing ? This is an empirical search and a Bihari scholar Prof. K. N. Mishra has realised the dream of the reformers by breaking up the scripts into symbols and configurations which reduce the number of strokes required remarkably...."[61]

Typewriters.—Bihar Government took comprehensive view of all problems which face Devanagari today and decided upon a typewriter which should incorporate the following features :

(*i*) The configuration of letters should be those at present in use for the Devanagari script so that the current way of writing in which all our literature is contained and to which all the writing devices are adapted may be continued.

(*ii*) The number of configurations should be adequate enough to give all the familiar forms of letters and punctuations current in Hindi without requiring us to modify the mechanism of the modern typewriters.

(*iii*) The position of the letters should be fixed from the point of view of the number of times strokes could be given to any key of the typewriter in one minute, of the frequency of occurrence of each particular letter in the Hindi language and of the strength of each of the figures of the hands

(*iv*) The psychological strain and fatigue on the typists in putting the vowel-mark first and then the consonant should be avoided by normalising typewriting.

(*v*) The typewriter should be adapted to meet also the needs of regional languages.

(*vi*) The keyboards should be complete in forty-four or forty-six keys.

Five existing typewriters and two other keyboards proposed and exhibited on converted machines were examined and that devised by Prof. Mishra was accepted. The Committee that examined the keyboards awarded it 77 marks out of 100 as against 38 to Remington, 34 to Underwood (1), 37 to Underwood (2), 44 to Olivetti, 44 to Ajanta, 38 to Corona and 46 to Mr. Ajit Singh's adaptation of the Remington Keyboard.

Apart from the facilities provided by Prof. K. N. Mishra's inventions, the manufacturers introduced certain novel features on the suggestions of the State Governments. *The provision of half spacings and dual*

control made it possible for Devanagari characters to have proportionate width as in Hindi print.

Mechanical composing.—The problems in respect of line composing as enumerated by Haranandan Prasad are :

(*a*) how to frame a keyboard which will provide all basic letters in Hindi so placed in the keyboard lay-out as to give maximum speed;

(*b*) how to make the overlapping vowel-symbols visually inoffensive and uniform in application to all letters ;

(*c*) how to devise a keyboard which may successfully accommodate all the Hindi characters, full letters and half letters, the vowel-symbols, the necessary punctuation marks—all in the standard magazine of ninety channels which is good enough for English, together with a very few Pi-characters.

" All the above problems have been tackled by some patents of Prof. K. N. Mishra. Some of his six patents, already sealed, have been used for Hindi typewriters."

" What Prof. Mishra has done, first of all, is to create space in each letter by slightly elongating the top bar rule to the left and not to the right as hitherto. This little change, apart from removing a phonetic anomaly, has almost revolutionised the typing and printing of Hindi. For, among other things, this invention makes it possible for overlapping vowel-symbols to fall adjacent or immediately next to the Hindi character, thus making these characters inoffensive to the eye, and fulfilling the dream of reformists."

" The invention of Prof. Mishra makes it possible to operate the vowel-symbols of all kinds, overlapping or non-overlapping, by modifying the basic letters themselves, and not the half-letters as in the Linotype scheme in existence."

" Since the basic letters and the vowel-symbols of Hindi can easily be placed in the six rows of the Linotype keyboard both vertically and horizontally, and since only these rows can effectively come within the range of fingering or speedy operation, the problem of working out the same speed for Hindi as for Roman has been successfully solved."[62]

51. Yathaartha Darshin (1956) [63]

1. In the Dravidian (and English) languages there are the short and long ए and ओ. There is a different symbol to write ' tell ' from ' tale '; ' past ' from ' paste '; ' most ' from ' post '. Devanagari should devise new symbols for the short ones and add to its series.

2. Similarly it should adopt a new symbol, for phonetically pronouncing ' a ' in ' bank ', ' bat ', etc., or the ' o ' of ' mob ' or ' morning ' and ' a ' of ' hall '. In the absence of a symbol for these, Hindi and Gujarati people pronounce and write these in a highly distorted manner, taking the forms ' *baink* ', ' *bate* ', ' *mobe* ', ' *mourning* ', and ' *hole* '.

3. Marathi has adopted the mark of the crescent ' ◌ॅ ' to be put on ब, मा, हा so that the above words are written as बँक, बॅट्, मॉब्, मॉर्निंग and हॉल् and not as बैंक, बेट, मोब, मोर्निंग and होल् necessitating the pronunciation to get highly distorted! The Devanagari script and the other languages should also adopt this sign.

4. For the short ए (*e*), of ' tell ' and for the short ओ (*o*) of ' most ' I would suggest the symbol ◌ु which is the vowel-sign of उ i.e. अँ and आँ

5. The vowels should be written as the *Pandharakhadi* as below :—

अ आ अि अी उ ऊ अँ अे अै आँ ओ औ अॅ अं अ :

क का कि की कु कू कँ क कै काँ को कौ कॅ कं क :

52. Dr. R. J. Phadake (1956) [64]

1. The following aspirated (*mhaāprāṇa*) consonants may be represented by adding ह् to the unvoiced and voiced unaspirated consonants:

ख घ छ झ ठ ढ थ ध फ भ

वह् ग्ह् च्ह् ज्ह् ट्ह् ड्ह् त्ह् द्ह् प्ह् ब्ह्

2. ङ and ञ may be dropped. वाङ्मय may be written as वांग्मय.

3. The compounds क्ष, त्र and ज्ञ may be replaced with conventional conjuncts.

4. Either of the consonants श and ष may be retained.

5. क and र may be written as का and ɾ.

6. The total types in the fount for typewriting will be 29 as under:

Vowels *mātrās* ◌ा ◌ि ◌ी ◌े ◌ु ◌ू ◌ै

Consonants— क ग च ज ट ड ण

त द न प ब म

य र ल व श ह ळ

53. Rao Bahadur N. S. Joshi, Poona (1957) [65]

The arrangement of letters in the Roman script is irregular. The vowels are far too less, only 5 to represent 16 vowel-sounds.

In Roman the vowel *a* represents the following vowel-sounds:—

अ in Postman आ in Father आँ in Fall

अॅ in Fat ए in Fate

On the other hand the sound अ is represented by all the vowels in the Roman alphabet.

(a) Postm*a*n ; (e) H*e*r ; (i) B*i*rd ; (o) T*o*n, and (u) F*u*n.

In Devnagari also the vowels fall short of the vowel-sound commonly used in the South Indian languages and also English. The transliteration of *Bell* and *Bail* in Devanagari is बे and *Tell* and *Tale* is टेल. Short आ cannot be represented in Devanagari.

ए (अई) and औ (अऊ) are *Sunyukta Swar* and therefore should not have been classed with basic vowels. The writer feels that ऐ and औ represented the sounds अॅ and ऑ. The vowels and vowel-signs suggested by Joshi are reproduced below:—

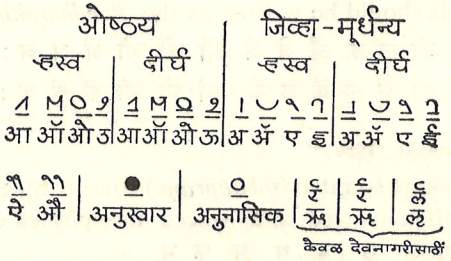


Fig. 188. **Joshis vowel-marks**

The use of new *swara lipi* as suggested by Joshi is indicated below:—

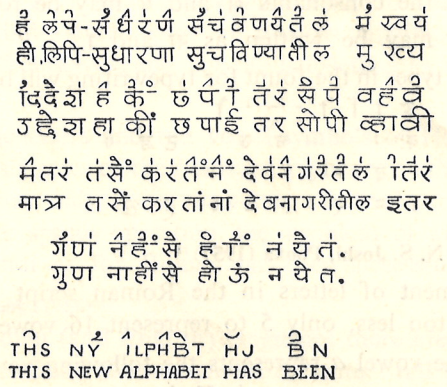


Fig. 189. **Joshis *Swaralipi***

54. Rambhau Mhaskar, Wardha (1961)[66]

The Roman type in 10 pt. can be read with ease but not the Devanagari in 10 pt. as the Devanagari letter is only 5 pt. and the remaining 5 pt. space is occupied by *Mātrās* and *Ukārs*.

The speed of writing is reduced to one-fifth in writing the head-line. The Gujarati letters look longer as the head-line is dispensed with.

The occurrence of *Ukārs* (descenders) is in the rules of only 1 to 6 *Mātrās* (ascenders) (i.e. 16%). If the *Ukārs* are placed after the consonants in the line as is done in case of रु and रू the body size of the type can be reduced by 20% without reducing the size of the letters.

55. Pandit Keshavaram Shastri, Ahmedabad (1962)[67]

Shastri, a Member of the Bombay Government Script Reforms Committee, states :

(1) Only four vowel-symbols अ इ उ and ऋ may be retained.

(2) The *anuswār* may be written as ◌ं and *anunāsik* as ◌ँ

(3) The vowel-signs or *mātrās* may be placed in the same line after the consonants.

(4) र may be written in the conjuncts as half र् in कर्ण=करण and full र in नम्र=नम्र. A new type with *halant* may be provided र्.

(5) A new type of *kānā* with *halant* may be cut for setting verti-bar letters with *halant*.

(6) ख may be taken from Gujarati and घ and भ may be written as ध and भ.

(7) The Bombay Style design of अ, क, झ, ण, फ, ल and श may be adopted.

(8) च (three-fourth य) may be used in conjuncts of the consonants without the verti-bar, i.e. नाट्य.

(9) श्र may be retained; ज्ञ may be retained for *tatsam* words only ; but क्ष may be replaced with क्ष, ळ may be added.

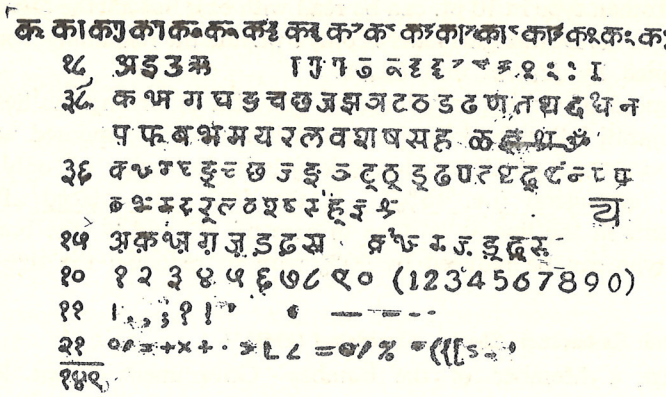
(10) Additional types of ङ, छ, ट, ठ, ड, ढ, द, र and ह may be cast with *halant*.

(11) क फ ल and ळ may also be cast in half forms क् फ् ल् and ळ्.

(12) *Nuktā* letters of अ and those of क, ख, ग ज, ड, ढ, स in both full form and half form may be provided.

(13) The total number of types with figures, punctuation marks and signs may be 149 as shown in *Fig.* 190.

A.



B.

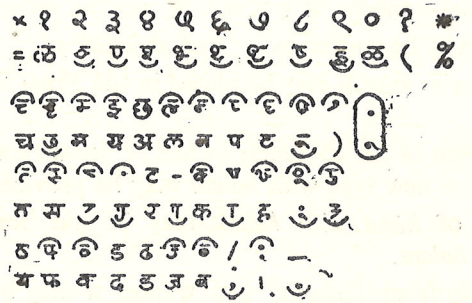


Fig. 190. **Fount Scheme of Keshavaram Shastri**

56. Dr Bholaram Trivedi (1962)[68]

Trivedi in his article *Devanagari as National Script* discussed the sounds in other Indian languages having no signs in the Devanagari script.

Malyalam — (1) Short ए and short ओ.
(2) Double dental र sounding like ट, sound between ष and ळ.
(3) Ward ऱ, Cerebral र.

Tamil — As in Malyalam (1) and (2) above.

Telugu — Two types of च and ज as in Marathi.

Kannada— As in Malyalam at (1) above.

Marathi — Two types of च़ छ़ ज़ and झ़.

Sindhi — ऍ ऑ ळ ऱ ट़.

Urdu — Three types of ज, two types of स, ह, झ, ञे and ते.

Trivedi, however, recommends :

1. The addition of the vowels—ऑ, ऍ, ओ and consonants—ऴ क़ ख़ ग़ ज़ ट़ ड़ ढ़ फ़ ऴ
2. The *mātrā* of इ may be placed after the consonant in the form of *velānti* and half-*kānā* ॅ.
3. The revised form ख may be used.
4. The conjuncts of र may be made by using *halant*.
5. For क्ष and त्र the simple forms of conjuncts क्ष and त्र may be used.
6. One of the two forms of the letters अ ग्र, ल, ल, श, श, झ, झ; ण, ण़ may be used.
7. ध and भ may be written as ध and भ.

57. L. A. Ravi Varma (1962)[69]

The scheme of Ravi Varma is explained in the chart given hereunder:

1. The number of vowel-signs is reduced to अ, इ, ऌ, ए, ऐ.
2. The long vowels written by adding a *kānā*, i.e. ई = इा ; ऊ = उा .
3. Short इ *mātrā* ि shall be joined from left. The type will therefore be cut without shoulder or bevel. All other *mātrās* shall be joined from right.
4. Special signs are suggested in the chart as follows :
   No. 8 for *Samvarta-U-Kāra* from Malayalam.
   No. 12 for short '*e*' of Dravidian language.
   No. 15 for short '*o*' of Dravidian language.
   No. 21 for Gingivial '*t*' of Dravidian language.
   No. 43 for Gingivial '*n*' of Dravidian language.
   No. 44 for Gingivial *Ardhakshara*.
   No. 49 for hard *R* of Dravidian language.
   No. 58 for special *zh* sound of Dravidian language.
   No. 62 to make vowel-free consonant at the end of words.
   No. 63 sign for Sanskrit only.
5. *Anuswār* shall be replaced by the half nasal consonant कं = कम्.

1	अ		22	त	ट	43	ऩ	ऩ
2		ा	23	प	ट	44		न्
3	इ	ि	24	ख	ख	45	म	म
4		ी	25	छ	छ*	46		म्
5	उ	ु	26	ठ	ठ*	47	य	र
6		ू	27	थ	ट	48	र	र
7		ृ	28	फ	फ*	49	ऱ	ऱ्
8	ॠ*	ॄ	29	ग	ग	50	ल	ल
9		ऌ*	30	ज	ज	51		ल्
10	ऌ		31	ड	ड	52	व	व
11	ए	ॅ	32	ढ	ढ	53	श	श
12	ऍ	ॆ	33	ब	ब	54	ष	ष
13	ऐ	ॅा	34	घ	ट	55	स	स
14		े	35	झ	झ*	56	ह	ह
15		ॅे	36	ढ	ढ*	57	ळ	ळ
16		ै	37	ध	ट	58	ऋ	ऋ
17		ः*	38	भ	भ	59	क्ष	क्ष
18	क	ळ	39	ङ	ङ	60	ज्ञ	ज्ञ
19	च	च	40	ञ	ञ	61	श्री	
20	ट	ट	41	ण	ण	62		ः*
21	ढ़	ढ़	42	न	न	63		ऽ*

Fig. 191. **Alternate forms of Devanagari letters suggested by Ravi Varma**

6. The conjuncts shall be made by placing the consonants one after the other. The design of half forms of the following consonants is changed to suit the conjunct formation :—

No. 18 क्	No. 28 फ्	No. 39 ङ्	No. 56 ह्
No. 20 ट्	No. 32 द्	No. 48 र्	No. 57 ळ्
No. 26 ठ्	No. 36 ढ्	No. 50 ल्	

It may be noted by reference to the chart that in case of क् and फ् the central bar is dropped. In case of ठ् a dot is placed in the counter and in all other cases including र्, the small bar or the joint to head-line is omitted.

7. The *rafār* in कर्क, धर्म etc. shall be written as ▫ i.e. क▫क, ध▫म. The full र in conjuncts shall be written in original form ग्रह = ग्रह.

58. Vaidya Narayan Tatu Thakur (1964)[70]

(1) The *Bārākhadi* of अ may be accepted in replacement of 11 signs.

(2) ऋ, ॠ, ऌ and ॡ may be omitted.

(3) क्ष and ज्ञ may be written as क्श and द्न्य.

(4) ङ may be constructed by placing full point after ड.

(5) ञ may be replaced with य followed by dot.

(6) The variations of the conjuncts of र may be dropped. But special forms ◡, श्र, and त्र may be provided for.

(7) स may be written as र न=स.

(8) The letters ख, घ etc. may be written by adding ह sign ▫ as ख, घ, छ, झ, थ, ध, ठ, ढ, फ, भ, ष.

59. L. S. Wakankar (1964)[71]

L. S. Wakankar was calligrapher to the Script Reforms Committee appointed by the Bombay Government in 1949-50. He was once in the reformist camp but after close examination of the palaeographic evidence on evolution of the Devanagari and sustained study of the research work of the veteran epigraphist, Shri A. B. Walawalkar, he was converted to the traditional school. He disapproves the *Swārakhadi* of अ and the Lucknow ख. He has come to the firm conclusion that the traditional designs of Devanagari characters, as far as they are scientific, should not be altered, as he says that the Devanagari script can be (and he *asserts* has already been) successfully adapted to mechanical composing machines.

मबजप 1200 अहक 4/5 के अेस सक्सेना गोपबंधुनगर 8 दोपते शब्द 139 पृ 1/1 ...
युगवार्ता बंबअी अअअ युगवार्ता नागपूर ....

गोपबंधुनगर आठ जनवरी वीराम प्रधानमंत्री श्री नेहरूके स्वास्थ्यमें पर्याप्त सुधार हो गया है अनुच्छेद दीलूलीसे आये डाक्टरोंके अुपचारके बाद अुन्होने कल रात डाक्टरोंसे प्रसन्न मुद्रामें बातचीत की और रातभर अच्छी नींद सोये अनुच्छेद अींदीरा गांधीने पत्रकारोंको पण्डालके बाहर बताया की श्रीनेहरू कमरेमेंही कुर्सीपर बैठकर पढ और बात कररहेहैं वीराम साथही आपने कहाकी आज बहुसे नेताओंनेभी श्रीनेहरू से भेट की और श्रीनेहरू ने श्रीकामराजसे सवीस्तर चर्चायें करनी चाहीं पर श्रीकामराज समयका अभाव बताकर स्वयं वहांसे खीसक गये ताकी श्रीनेहरूको कष्ट न हो अींदीराजीने यहभी बतायाकी प्रधानमंत्री अभी यहीं ठहरे हुअे है और यहांसे नीर्धारीत समयसे पूर्व जानेका अुनका कोअी कार्यक्रम नहीं है दूसरा समाचार पता चला है की महाराष्ट्र व मूहैसूर सीमाके वीषयमें महाराष्ट्रके मुख्य मंत्री श्रीनायक व मूहैसूरके मुख्य मंत्री श्रीनीजलींगअप्पाने प्रधानमंत्री श्रीनेहरू व गृहमंत्री श्री नंदाकी अुपस्थीतीमें परसो यहां राजभवनमें प्रायह् घंटाभर बातचीत की अनुच्छेद बातचीतका यह सीलसीला जारी रतनेके लीये दूसरी बैठकभी अुनकी यहां कभीभी हो सकती है अीती .... क़ स़ 4/1

Fig. 192. **Current method of setting Devanagari on the teleprinter.**

Original contribution was made by L. S. Wakankar to South Asian Epigraphy in establishing the origin of the Koranic Arabic Script (as opposed to the Aramaic-origin of scripts Sinai, Lihayan, Thumidine, Sabian and Proto-Hebrew) from the Proto-Girnar Script of Asokan Brahmi in 1950-51. His another research paper on evolution of Devanagari script, developed under the guidance of A. K. Priolkar, appeared in *Marathi Sanshodhan Patrika*. Wakankar came to the limelight when he delivered a talk on Devanagari Script and its Typography in 1961 at the Government Institute of Printing Technology, Bombay. Later, he collected valuable data on type-founding and mechanical composition during his tour of the Continent of Europe in 1962. It was after a comparative study of Roman Typography and Indian Calligraphy, that he wrote a series of articles on 'Characteristics of Devanagari[72]' and its sign-list. Just as the European and American Typographers have always remained faithful to the basic characteristics of the Trojan Column Roman Inscription, Wakankar believes that adherence to fundamental Brahmi Phonography as reconstructed by A. B. Walawalkar should remain the pre-requsite of Indian script designs. Wakankar has studied the present method of setting Devanagari on the teleprinter (*see Fig.* 192). He has made a novel suggestion in this regard which is referred to in Chaptar XIII.*

60. M. N. Gogate (1964)[73]

1. Gogate states that the Devanagari is not logical, is inconvenient for printing and indexing and is inferior to the Roman script. The defects in the Devanagari script are enumerated by him as under :

(1) Only one superior dot is used for the nasals ङ्, ण्, न्, म्, कार्यं and ह्रस्व.

(2) The phoneme र is written in different ways, *i.e.* राम, ट्रक, अग्र,

(3) The word संत is also written as सन्त and लौकर is written as लवकर. This is against the principle of one grapheme for one phoneme.

(4) The pronunciations सकरि, शाम्, दुक्ख, अवश्य are wrongly written as सरकार, श्याम, दुःख and अवश्य.

(5) The *rafār* between two letters in the word मूर्ति is written last.

(6) The graphemes of conjuncts ट्य, ड्र, etc. are irregular in that the full letter is written in half form.

* Chapter XIII, pp. 341-63.

(7) The placement of vowel-signs is not convenient for printing.

(8) Pronunciation Tru (ट्रु) is required to be set as टरू.

(9) The method of writing conjuncts of the three groups, i.e. verti-bar letters, small-bar letters and central-bar letters differ.

(10) Compounds are provided for conjuncts क्ष=क्ष ह्म=भ, but not for ब्य, क्ल etc.

(11) Alphabetic order is not standardised.

2. Gogate advocates the acceptance of Roman script for Indian languages. He also suggests some modifications in the Devanagari :

(1) International forms of numerals may be accepted in Devanagari.

(2) Distinction between short and long vowel-signs may be dropped.

(3) The distinction in the meaning of सुत and सूत; विचार (ask) and विचार (thought) will be clear from the context.

(4) Writing should be according to the pronunciation, i.e. रूषी for ऋषी ; म्रूग for मृग; त्रितीया for तृतीया ; विश् for विष; चन्चल् for चंचल; दुक्ख for दुःख; सिंव्ह for सिंह; हंव्स for हंस ; पुण्ण्य for पुण्य; साहित्त्य for साहित्य.

(5) ऋ, ष, ज, *Visarg* (:) may be omitted.

(6) The graphemes च etc. are used for two distinct phonemes. They should be represented by separate graphemes.

(7) Graphemes should be provided for the foreign pronunciations, अँ, ऑ etc.

3. Gogate recommends the following lower-case roman letters for Marathi, arranged in alphabetic order :—

Table 83 : **Gogate's Roman Alphabet**

a	ā	b	c	c̄	d	ḍ	e	e	f	g	h
अ	आ	ब्	च्	च्	द्	ड्	ए	अँ	फ्	ग्	ह्
i	j	j̄	k	l	ḷ	m	n	ñ	ṇ	o	o
इ	ज्	ज्	क्	ल्	ळ	म्	न्	ङ्	ण्	ओ	ऑ
p	r	s	s̄	t	ṭ	u	v	y		,	
प	र्	स्	श्	त्	ट्	उ	व्	य्		*Ardhanunasik.*	

4. For Sanskrit the following additional symbols may be used :—

ī	ṛ	ṣ	ū	ȳ	:
ई	ऋ	ष्	ऊ	य्	*Visarga*

5. The new letters (with diacritics) may be named as a = ए; ā = A-bar; c̄ = C-bar; ḍ = D-dot.*

*Gogate has since recommended the substitution of Roman capitals for 'bar' and 'dot' letters.

6. Typical Marathi words are written in Gogate's Roman as under :— मराठी = marāṭhi; दिल्ली = dilli; श्रीकृष्ण = srikrisṇa; जॉन केनेडी = Jon keneḍi; मेष = meṣ; सिंह = si'vha; मे = me; ऋषि = ruṣi.

61. P. B. Kale's Reforms in Devanagari (1962/64) [74]

P. B. Kale who wrote an article in the *MasikManoranjan* in 1915 on script reforms reverted to this subject again after forty-eight years. Kale states that in comparison the time and space required for setting Devanagari is of the order of thirty per cent to forty per cent more than that of Roman script. If vowel-signs could be developed for setting, along with consonants in the same line, after the consonants as per pronunciation, the difficulty in composing Devanagari script would be eliminated.

अ.पण-पत्रीका.

१ वर दाखविल्याप्रकारचा कळफलक दीला आहे.त. पहील्यात स.पू.ण व्य.जना व ११ स्वरचीन्हां दीली आहे.त.दु-
२ सऱ्या कळफलकातील अ.ध्या व्य.जना.चा "अ"कारा.त रूप करण्यात आघात जास्त लागतील. १०० शब्दा.त
३ असा आघात ८४ यातात. त्यामुळे हा पध्धतीत जागा व वेळ जास्त लागेल.दोन्हीतील फरक,अक्षरा-
४ अक्षरातील अ.तर वगळल्याचे दृष्य डोळ्यात अेकदम भरावे म्हणून काही मजकूर दोन्ही पध्धतीनी
५ वर छापला आहे. तसेच स्वरचीन्हा.चे प.याय रूपे दीली आहे.त. त्यातून अथवा आमलात नीराळी रूपे
६ तद्भा.नी, साे.द.ऱ्याची दृष्टी असणारा.नी नीवडावीत. फक्त तत्व हे की, ही चीन्हां व्य.जनान.तर त्याच
७ ओळीत ट.कलीजीत झाली पाहीजेत. त्यात "अचल अनुगामी" कळा नकाेत, म्हणजे गती कु.ठीत हो
८ णार नाही छापण्याकरता १०८ ओळी लागतील, हे वर स्पष्ट केले आहेच. त्यामुळे सेव.घ दोवनागरी-
९ तील कोणताही ग्रंथ छापता येऊील आणी ते सुलभ वाचता येऊील. शीवाय टाऊीप जुळणे सोपे
१० जाऊन कागदाची व श.ईची बचत होऊील. पुस्तका.च्या कीमती कमी होतील. कागदाकरीता लागणारा
११ फा.रीन अेक्स्चें.ज कमी लागेल हा फायदा महत्वाचा आहे. ही श.ईबी मला १९०९-१० साली सुचली;
१२ व ती मी "मासीक मनोरं.जना"तून प्रसीद्ध केली. दु.ईदैवाने कोणत्याही स.शोधकाचे लक्ष हे तत्व
१३ वेधून शकले नाही. ५० व.षा.च्या आटोकाट पयत्नान.तर ही दोवनागरी लीपीची या.त्रीक का.यक्षमता
१४ (Efficiency) अजून पू.ण.त वाढलेली दीसत नाही. हे तत्व अ.गीकारल्याशीवाय दोवनागरीचे भवीतव्य
१५ घोक्यात आहे, असे मला नीक्षून सा.गावेसे वाटते. ५० व.षा.चा अेतीहास आज हेच सा.गत आहे.
१६ काेणालाही हा लेाप व ताेचा पध्धत आणा श.ईबा या.चा स.रास अुपयाेग करता यऊेल. लाेनाेटाअेप,
१७ माेनाेटाअेप, ट.कलेऊन हा.च्या य.त्र-कारखानदारा.नाही वापरता यऊेल. फक्त अशा व्यापारा क.पन्या.
१८ ना "डा.दळवा स्मारक शाळा, रुग्णालय" आतेवारा, नागपूर, हा स.स्थेला खेच्छेने याेग्य वाटेल तेे अ-
१९ नुदान द्यावे, हा आेच्छा मा ता.२५-८-१९६२ राेजा पगट केला आहे.
२० शेवटी ही लीपी व तीची पध्धत आणी श्रुबी मी भारताच्या अेकात्मतेचा आजचा प्रतीक पं.डीत
२१ जवाहरलाल नेहरू या.च्या चरणी वीनम्रपणे अ.पण करीत आहे.
२२ नागपूर, रामनवमी, साेहर चेत्र,१२,१८८५, तारीख २-४-१९६३.

टीप:- टाऊीप बा~ डी ९ पा~ऊी.ट; अक्षरे ४॥ पा~ऊी.ट; वेला.टी २ पा~ऊी.ट; अुकार १॥ पा~ऊी.ट.
स्वरचीन्हे-ओळी १ ते ९-ी, ी, ु, ू, १०-१५ े, ै, ो, ौ, १६-१९ ृ, ॄ, ॅ, ॆ, ॊ, ो; शेवटी-ँ, ं, ः, ़.
शीवराज फाऊेाेन अेा.ट आ फेसंट लीचाें, नागपूर.

Fig. 193. **Linear design of Kale's Devanagari**

All efforts to make the Devanagari a fit script for mechanization, according to him, have failed, in spite of dissecting the letters in all sorts of ways both horizontally and vertically. Kale states that these years

have not been lost in vain because he claims that people have come to the conclusion that the present Devanagari script is not capable of being mechanized in the modern sense.

According to Kale mechanization means the following :

(*a*) Reduction in time and space to the minimum and ease of composing or typing. Unless the script submits itself to these three factors efficiency cannot be achieved and the script cannot be put on par with the Roman script.

(*b*) Devanagari is phonetic and therefore if proper vowel-signs are evolved, it will be more efficient than the Roman script for all the Indian languages except probably for Tamil.

Kale has evolved after four decades of silence, vowel-signs which he feels are not unfamiliar to our present Devanagari. The only thing he has done, he states, is that vowels are put after the consonants according to the pronunciation of the word. The case put up by him is summarised below in his own words :

The Problem

In the matter of typewriting or composing with three-step composition in Devanagari the efficiency is reduced by about 40%, white space wasted is about 30% which results in the increase of cost for typing and printing. Books and newspapers should be as cheap as English books and newspapers are, for the same coverage of contents of the subject-matter. Today this difference is about 40%. Text-books will be required by crores as we have set our goal to achieve compulsory primary education within the next fifteen years.

The cost and time involved in using Devanagari in teleprinting is about 30% more than that required by using Roman script.

The object of mechanisation is not for achieving overall efficiency including economy of time and saving of expenses after providing for interest, depreciation and maintenance cost of the machinery.

The Requirements

(*a*) The script should be the same for both Printing and Typewriting so that a standard script for all purposes could be used.

(*b*) This limits the number of characters to 92 only for typewriters.

(*c*) There are only 90 matrices available on the Linotype or Intertype machine (also Photon).

(*d*) The side magazine of these two machines could be used for sparingly used characters, such as ?, +, ÷, =, s, and *.

देवनागरीटाइपरायटरच्या दोन तऱ्हांची मुद्राचीन्हें. यांतील जो जास्त उपयुक्त ठरेल तो स्वीकारावा, अथवा दोन्ही आपआपल्या मर्जीप्रमाणें स्वीकारावी. माझ्या मताप्रमाणें संपूर्ण व्यंजनें व ११ स्वरचीन्हें ज्यात आहेत त्यात आघात कमी लागतील व जागेची बचत होईल. दोन मुद्रा चीन्हांत तोंच मजकूर लीहीला आहे त्यावरून दोन्हीतील फरक व अक्षराक्षरांतील अंतर याचें दृश्य डोळ्यापुढें दीसेल व त्यावरून नीर्णय घेण्यास मदत होईल. आरंभी अी, अी, ु, ू, ृ व ॅ ची नीरनीराळी चीन्हें दीली आहेत. त्यातून तज्ज्ञांनी व कलाकारांनी जेणेंकरून साहित्य वाढेल अशी नीवडावी तें. कोणाला त्यांत आणखी काही भर घालावयाची असेल तर ती घालून नंतर नीवड करावी. याचें कारण ही पद्धत पेटंट कोलेली नाही व करण्याची अीच्छाही नाही या लीपीची पद्धत स्वीकारली तर त्यायोगें करण्याच्या अुत्तरकेडील सर्व लीप्यांचें टंकलेखन, छपाअी (ज्यात भीळें हातानें, मोनोटाटाइप मशीननें अगर लीनोटाइप मशीननें जुळवीणें अगर पाडणें अीत्यादी क्रीयांचा समावेश होतो तें)...

आलीले आळीतील अुच्चीतुलना करण्याकरता 0·१७" ठरवली आहे कारण तीन स्तंभी अक्षरांत ती 0·२२५" असतें स्टॅन्डर्ड त्याच अथवा त्यांचें घटक रहातील "जर तीन स्तंभी अक्षरें महाराष्ट्र सरकारच्या टंकलेखन समीतीनें सुचवील्याप्रमाणें वापरली तर कार्यक्षमता ६० तें ६५ टक्कें यांजेल आणी जागा १७ टक्कें जास्त लागेल, ठोकें पण १५ टक्क्यानी वाढतील"

देवनागरीटाइपरायटरच्या दोन तऱ्हांची मुद्राचीन्हें. यांतील जो जास्त उपयुक्त ठरेल तो स्वीकारावा, अथवा दोन्ही आपआपल्या मर्जीप्रमाणें स्वीकारावी. माझ्या मताप्रमाणें संपूर्ण व्यंजनें व....

—o—o—o—

कळफलक नंबर १ मध्यें तीन आळींत २५ शब्द, आघात १५४.
कळफलक नंबर २ मध्यें तीन आळींत २२ शब्द, आघात १६०, शीवाय जागा १० % जास्त. २५ शब्द पुरवें करण्याकरता आणखी १६ आघातांची जरूरी आहे. अक्षरांच्या व्यंजनांचा कळफलक महाराष्ट्र सरकारच्या देवनागरी टंकलेखन कळफलक समीतीनें सुचवीलेला आहे. यावरून या कमीटीनें या महत्वाच्या वीषयावर सर्वांगीण वीचार कोलेला दीसत नाही अशी कल्पना झाली तर नवल नाही. १०० शब्दांत अुणीपुरी अेकूण अेकाक्षरांत व्यंजनें ८४ यांतील म्हणजें ८४ आघात जास्त यांतील. जर तीन स्तंभी अक्षरें महाराष्ट्र सरकारच्या टंकलेखन समीतीनें सुचवील्याप्रमाणें वापरली तर कार्यक्षमता ६० तें ६५ टक्क्यावर येईल आणि जागा १५ तें १८ टक्कें जास्त लागेल. अुदाहरणार्थ:-

"जर तीन स्तंभी अक्षरे महाराष्ट्र सरकारच्या टंकलेखन समितीने सुचविल्याप्रमाणे वापरली तर कार्यक्षमता ६० ते ६५ टक्यावर येईल आणि जागा १७ टक्के जास्त लागेल, ठोके पण १५ टक्क्यानी वाढतील"

छपाअी की बारहखडी

स्वरचीन्ह:-अ, ा, ि, ी, ु, ू, ृ, ॅ, े. वीशेष चीन्ह :-हलंत ्, चांदः- ँ, ं, र=्र, ः, ऽ, क्ष=क्ष, ज्ञ=ज्ञ, च, त्र, श्र.

व्यंजन :- क, ख, ग, घ, च, छ, ज, झ, ञ, ट, ठ, ड, ढ, ण, त, थ, द, ध, न, प, फ, ब, भ, म, य, र, ल, व, श, स, ष, ह, ळ.

अर्धव्यंजन:- क्, ख्, ग्, घ्, ङ्, च्, ज्, झ् ञ्, ण्, त्, थ्, द्, ध्, न्, प्, फ्, ब्, भ्, म्, य्, ल्, व्, श्, स्, ष्, ह्, क्ष्, ज्ञ्.

कुल टाअीप : १०८ (स्वरचीन्ह ९, संपूर्ण व्यंजन = ३३, अर्ध व्यंजन=२८, अंक १०, चीन्ह = १९, वीशेष चीन्ह= ९)

स्वरचिन्हो के पर्याय:-इ=ि, ि, ि, ि, ि, ि. उ:-ु, ु. ए:- े, े, े, े, े, े. ओ:- ॉ. ऋ:-ृ, ृ. विसर्ग और मध्यविराम-':'.
ई=ी, ी, ी, ी, ी, ी. ऊ:-ू, ू. ऐ:- ॅ, ॅ, ॅ, ॅ, ॅ, ॅ. औ:- ॉं. अनुस्वार और दशांश चिन्ह-'·'.

Fig. 194. **The Kale Alphabet for Linear Setting of Devanagari**

The Solution

(*a*) Just as Government of India has accepted the principle of linear composing of conjuncts in Devanagari, if they so approve the same principle for forming syllables in Devanagari by linear composing, the problem is solved. This means the method of joining vowel-signs to consonants should be linear and according to pronunciation. The method of joining signs like *rafār*, *ardhachandra* and *halant* should necessarily follow the same pattern, i.e. linear composing according to pronunciation.

(*b*) The method of joining य and र to all consonants should be standardised by the use of च and ह, e.g. त्याग should be composed as तचाग and राष्ट्र as राष्टह or प्राण as पहाण. The short horizontal line below the head-line represents the *halant* form of the preceding consonant.

(*c*) By using these two forms च and ह about 40% to 50% of the problem of forming conjuncts in any write up in Hindi will be solved and all conjuncts with च and ह, which are after all half-vowels, will look alike. In Marathi 65% of this problem will be solved.

(*d*) By adopting this method, the use of ङ, ट, च, ड, ढ, ह, ह, फ, ढ, ॅ, ह, श्र, त्र, क्ष, and ज्ञ could be eliminated. The conjuncts of these letters with consonants other than य and र are so small, that they could be formed in *halant* without affecting the beauty of the script. However to make the fount of 96 types, two out of च, ढ, ह, ह, and श्र could be retained.

(*e*) When we accept the principle of forming conjuncts of य and र as mentioned above the problem of conjuncts श्र and त्र is solved. श्र will be written like this शह or श्र, and त्र in त्र्यंबक like तह्यंबक. The consonant श can be taken in either form श or श्र but only one form and not two.

(*f*) Similarly the adoption of ख in its present form does not solve the problem of distinguishing it from र and व. Vinoba's अ which is taken from Gujarati or *Modi* script is more rational.

(*g*) The conjuncts क्ष and ज्ञ should be composed as conjuncts on the principle of standardised formation of conjuncts.

(*h*) The consonant ङ seldom occurs either in its full form or *halant* in Hindi or other Indian languages. It could be taken as one complete letter in *halant* like ङ् or full consonant like ङ.

(*i*) The use of *Swarākhadi* as suggested by *Swatantrya-Vir* Savarkar, i.e. " ि, ी, ु, ू, ृ, े, and ै " should be accepted as we are already using " अ, आ, ओ, औ, अं and अ: ".

(*j*) If one accepts the above proposals we can reduce the number of characters to 92 (composed of 33 or 34 consonants, 17 or 16 half consonants depending upon what form of ङ is accepted, 9 vowel-signs including अ, 10 figures, 19 punctuation and other signs including *halant*, *ardhachandra*, decimal sign, etc. 3 signs for the letter र viz. *rafār* in वर्ग, तन्हा and राष्ट्र or प्राण by the use of ह and one sign for च; Total 92).

(*k*) The use of decimal sign . for *Anuswār* and of colon : for *Visarga* will solve this question of mechanisation.

(*l*) Lastly the four signs of + ÷ = and ?, which will be less on the typewriter, and whose use is very limited in ordinary typing, could be formed by the combination of – and ı for +, — and : for ÷, — and – by little turn to the roller for = and १ plus . for ?. Thus the types for typewriter could be 96 as equal to the fount of matrices for Lino or Intertype machine depicting all characters that occur in Hindi or any other Indian language.

The Results

(*a*) Types in smaller sizes up to 5 pt. in the suggested script could be perfectly legible and could be read with the same ease as the Roman script is read without affecting the eyesight.

(*b*) By use of smaller type or by avoidance of white space between lines or by both, the consumption of paper could be reduced by 30%.

(*c*) This will virtually effect, in not only saving of foreign exchange for paper, but in reducing the cost of books and newspapers which will be of the order of 40% to 45% (30% accounts of saving in paper and 10% to 15% in printing).

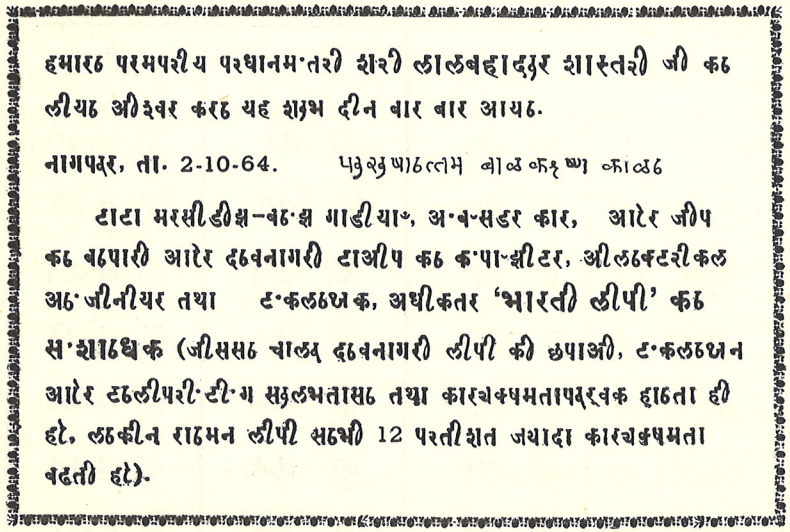
(*d*) Typewriting in the script could be as quick as with Roman script if not quicker and therefore commercial offices, Government departments could adopt the script for Indian languages in all their offices, without any loss of efficiency in either cost or time.

(*e*) Teleprinting in the script could be done with as much ease and cost as is possible with Roman script.

62. V. V. Shirvadkar

Kale was very studious and took note of any new suggestion which was made in regard to the scripts and their reforms. Recently Poet Kusumagraj (V. V. Shirvadkar), president of the Maharashtra Sahitya Parishad, made certain suggestions in regard to the linear setting of Devanagari. Kale immediately reduced them to graphic forms and

published his comments thereon. Kale's version of the suggestions of Poet Kusumagraj is produced in *Fig.* 195.



'उ' कार='ु' 'ू' as suggested by Kusumagraj ; 'ए' कार='ठ' 'े' from Bengali and Asamese Scripts

Fig. 195. **Kale's Version of Linear Devanagari suggested by Poet 'Kusumagraj'**

Shirvadkar's proposals were later circulated to the Maharashtra Mudran Parishad's Session held at Nanded. They are :

(1) New symbols are suggested for vowels except अ. They are based on the vowel-signs which can be set linearly.

(2) The *Rashtra-Chinha* is ^ proposed to indicate conjuncts i.e. द्र = द^र.

(3) The headline is dropped.

(4) The number of Devanagari sorts is rendered to only 48.

The use of vowel-signs and the conjunct sign is indicated in *Fig.* 196.

63. S. K. Toshakhani[75]

Toshakhani believes that "If the Devanagari consonantal characters are given the value of pure consonantal sounds the whole trouble vanishes (क=K and कअ=Ka). He points out that र in कर stands for 'r' but in रख it stands for 'ra' which is not logical. In Braja Language the final अ in words like च, ल, त is pronounced while in Khari Boli final अ in words like च, ल is not pronounced but no distinction is made in writing of Devanagari" which Toshakhani considers confusing.

स्वरचिन्हाचा वापर

जोडाक्षराची जोडखूण : ∧

उदा. क्क – क∧क, स्य – स∧य, त्य – त∧ध∧य.

स्वरचिन्हे	अ	क	ह्न
आकार ।	आ अ।	का क।	ह्ना ह∧न।
इकार ৭	इ अ৭	कि क৭	ह्नि ह∧न৭
ईकार ৩	ई अ৩	की क৩	ह्नी ह∧न৩
उकार ৬	उ अ৬	कु क৬	ह्नु ह∧न৬
ऊकार ৯	ऊ अ৯	कू क৯	ह्नू ह∧न৯
ऋकार ৪	ऋ अ৪	कृ क৪	ह्न ह∧न৪
ॲकार ৳	ए अ৳	कॅ क৳	ह्नॅ ह∧न৳
ऐकार ৷	ए अ৷	कै क৷	ह्नै ह∧न৷
ओकार ৸	ओ अ৸	को क৸	ह्नो ह∧न৸
औकार ৹	औ अ৹	कौ क৹	ह्नौ ह∧न৹
अनुस्वार ৺	अं अ৺	कं क৺	ह्नं ह∧न৺
विसर्ग ৻	अः अ৻	कः क৻	ह्न ह∧न৻

Fig. 196. **Shirwadkar's suggestions : Vowel-signs and the Conjunct sign.**

He considers "*mātrās* a great source of trouble to the compositor an make the task of inventing a simple typewriter in Hindi well-nigh hopeless."

Toshakhani says that with his method "morse-code can be adopted letter for letter, the long being denoted by a repetition of short vowels and the dots and bars for x, g, w will do duty for क्ष, ज्ञ, and औ, ऐ, will be denoted by dots and bars used for 'ai' and aspirates like ख by dots and bars used for 'k' and 'h'.

Toshakhani's method is illustrated below :

Hindi-Khadi Boli—

'वह धन ही क्या जो पडा रहे
धरती में गड कर दब जाये' (श्री गोपाल प्रसाद)
'वअह धअन हई कयआ जओ पअडा रअहए
धअरतई मए गअड कअर दअब जआयए'

Braja Bhasha—

'गल तुलसी की माल बनी जोहत मन मोहन'
गअलअ तउलअसई कई मआलअ बअनई
जओहअतअ मअनअ मओहअतअ

64. Shankar Anant Atreya[76]

1. ऋ, ॠ, ऌ, and ॡ, are not pure vowels. (र्+अृ= ऋ, र्+आृ=ॠ; ल्+अृ=ऌ; ल्+आृ=ॡ). In their place अृ and आृ may be substituted as pure vowels.

2. The present form of consonants such as र, द may be considered vowel less or *halant* forms. This convention will eliminate conjunct forms, i.e. बुद्धी=बुदधी, अर्धचंद्र=अरधचनदरा. The *halant* forms of verti-bar letters may be made by removing the verti-bar.

3. The central-bar letters and short-bar letters may be provided with a *Kānā* to represent vowel ending forms. क=क्, का=क, फ=फ्, फा=फ.

The vowel-ending forms of other short-bar the letters are :

डा, छा,, टा, ठा, डा, ढा, दा, रा, हा, ळा
ड छ ट, ठ, ड, ढ, द, र, ह, ळ,

4. The letter ज्ञ may be used for ख.

The list of type-sorts may be reduced to 53 as under :—

(1) ऊ ा ी ृ ॅ ॆ े ै ॊ ॆा ं ः 15

(2) क ङ ञ ट ङ , च छ ज झ ञ
ट ठ ड ढ ण , त थ द ध न
प फ ब भ म , च़ छ़ ज़ झ़
य र ल व श (ष), ष स ह ळ 38

The *Bārākhadi* of the central-bar and short-bar letters will be as under :

क का कि की कु कू के कै को कौ कं क:
= का काा की कीा कु़ कू़ को कौ कोा कौा कां का:
ट टा टि टी टु टू टे टै टो टौ टं ट:
= टा टाा टी टीा टु़ टू़ टी टौ टोा टौा टां टा:

The short ' i ' forms of verti-bar letters may be written as चि=ची, ति=ती नागरीचें नैयमन प्रात्यकषांत आणण्याच्या झटापटीतले पहिलें पाअूल म्हाणून प्रास्तुत पुस्तीकोचें लोढाणे महाराष्टरीय जनतेच्या गळचांत बान्धण्यांत येत आहो. नागरीचें नियमन प्रत्यक्षांत आणण्याच्या खटपटींतले पहिले पाऊल म्हणून प्रस्तूत पुस्तिकेचें लोढणे महाराष्ट्रीय जनतेच्या गळचांत बांधण्यात येत आहे.

65. Shankar Ramchandra Date

Date is one of the few typographers who has been continuously working on the Devanagari type-setting. His Monotype Devanagari brought out 35 years ago is currently in universal use and still remains the only method of setting Devanagari mechanically in its traditional design with minimum distortions. Date is opposed to alterations in the present 'look' of the script. He advocates minimum changes necessary for mechanical setting with full utilization of the keyboard capacity. His current proposal is as under :

1. The vowel-symbols इ ई उ ऊ ऋ ए ऐ may be replaced with *Bārākhadi* of अ i.e. अि, अी, अु, अू, अृ, अे, अै. The *Bārākhadi* of अ may be used in the text-books.
2. The *Rafār* may be replaced by half र i.e. ⁼ (सू-य=सूर्य. पू-व=पूर्व.). The unaccented र् in सू-र्यास may be written as ◌ i.e. सूर्यास and accented र् may be written as ⁼ i.e. नि-र्भीड, भू-र्दंड
3. The *Rafār* preceding ऋ may be written as र् as in नैर्ऋत्य, निर्ऋति.
4. In the conjuncts with short *i*, the short *i* of F may be written before the last member in the conjunct i.e. उद्‌भिज.
5. *Halant* is not used at the beginning of the word. व्दाड, व्दितीया, व्देष, may be written द्-वाड दि-वतीया, द्-वेष ह्-या.
6. Conjuncts with र as last member may be written as ख्रिस्त=खिस्त, ग्रास=ग्रास, क्रम=क्रम. The *Rāstra* sign (◌) may be retained in words ike राष्ट्र, द्राक्ष.

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Appendix B

DECISIONS OF THE COMMITTEES APPOINTED BY THE LITERARY ASSOCIATIONS AND THE GOVERNMENTS

1. Maharashtra Sahitya Parishad (1931-35)[1]

The Maharashtra Sahitya Sammelan in its Annual Conference held in 1927, appointed a committee to consider the standardisation of the Devanagari script. A conference of the script reformers and those interested was called at Poona by N. C. Kelkar, the chairman of the committee (1931) when the following decisions were taken :

(1) The vowel-symbols may be formed by attaching the vowel-signs to the basic vowel. अ. i. e. अि. अी. अु. अू.

(2) The construction of the conjuncts in the ligature form should be discontinued in favour of linear setting.

(3) The principle of providing a *kānā* to क फ and र (i.e. का, फा and ार) is accepted but may not be put into practice immediately.

The Maharashtra Sahitya Sammelan again in its Kolhapur Session, presided over by the Maharaja Sayajirao Gaikwad *in absentia*, passed a resolution on the script reforms and a committee was appointed to go into the problem again. After much deliberation the following decisions were taken in the meeting (25th December 1935) :

(1) Attempts should be made to eliminate the head-line as it is not essential in Devanagari letters.

(2) The vowel-symbols इ ई उ ऊ ए ऐ may be replaced by *swarākhadi* of अ i.e. अि, अी, अु, अू, अे, अै.

(3) The vowel-signs of ई (long *velānti*) उ ऊ (*ukār*) and ए ऐ (*mātrā*) may be placed after the letters and not exactly above or below (कि कु).

(4) The vowel-sign of short इ (short *velānti*) should be placed after the letter and joined below the verti-bar.

(5) The consonants in conjuncts should be placed one after the other.

(6) The forms of the consonants in conjuncts may be made by removing the verti-bar while the consonants like ट ठ etc. may be joined with ⌐ to the next letter. The absence of vowel in the last letter may be shown by *halant*.

(7) The *reph* ◌ᵣ may be placed between two letters in the form of small र cutting the head-line, धर्म=धरम.

(8) Open dot ◦ may be used for full *anuswār* and a dot for *anunāsik*. They should be placed after the letters (क◦ and क.).

(9) The *charan-regh* । may be used for the full-point.

(10) The letters ञ, झ, ए, may be written in the Bombay style, i.e. अ, झ and ण, श may be written with loop श, *i.e.* and ल may be written in the Hindi style ल.

(11) The pronunciation of short ए and short ओ in the South Indian languages may be indicated by *mātrās* of special design.

(12) All the figures should be in the Bombay style.

(13) The dento-palatal, च and other pronunciations may be indicated by a point before the letters touching them.

(14) The present forms of letters ॐ, ज्ञ, श्री and क्ष used in Algebra may be retained.

(15) Kakasaheb Kalelkar, Y. R. Date and S. R. Date were requested to propagate these recommendations.

(16) When the above reforms receive general acceptance the *mātrās* may be written as ◌ि ◌ी ◌ु ◌ू ◌े ◌ै in the same line.

2. Hindi Sahitya Sammelan (1934)[8]

The script reforms were discussed in the Annual Conference of the Hindi Sahitya Sammelan held in 1934 at Delhi when Late Sayajirao Gaikwad was the President. A committee of the following persons was appointed:

(1) Prof. Virendra Varma, Prayag,
(2) Dr. Sunitikumar Chatarji, Calcutta,
(3) Dr. Nalinimohan Sarkar, Calcutta,
(4) Br. Vinayak Damodar Savarkar, Ratnagiri,
(5) M. M. Pandit Gaurishankar Oza, Ajmer,
(6) Shri Anand Shankar Dhruv, Kashi,
(7) Shri Satyanarayan Sinha, Madras.

In its 24th Conference held, at Indore in 1935, personnel of the committee was revised under the convenorship of Shri Kakasaheb Kalelkar as under :

(1) Shri Kakasaheb Kalelkar, Wardha (Convenor),
(2) M. M. Pandit Gaurishankar Hirachand Oza, Ajmer,
(3) Shri A. C. Bulnar, Lahore,
(4) Dr. Sunitikumar Chatarji, Calcutta,
(5) Shri Pisharoti, Madras,
(6) Shri Babu Ram Saksena, Prayag,
(7) Shri Kishorlal Mashruwala, Wardha,

(8) Shri Lalataprasad Shukla, Calcutta,
(9) Shri Hari G. Govil, Calcutta,
(10) Shri Shankar Ramchandra Date, Poona.

The committee held its meetings at Wardha on 25th June 1935 and at Prayag on 23rd April 1936. Laxman Swaroopji, Lahore, Dr. Raghuveerji, Lahore, and Yashvantrao Date, Poona, were co-opted and Sarvashri Mukunda Das-Gupta, Kashi, Ranajeet Sitaram Pandit, Prayag, Kedarnath, Kashi, Baba Ragavdas and Purushottamdas Tandon were present by invitation. The committee circulated a draft for public opinion. The final report was presented to the Nagpur session of the Sammelan and subsequently adopted by the standing committee in its meeting held on 24th/26th March 1937.

The decisions of the standing committee are given below :

(1) The head-line is not necessary in writing ; in printing it should be retained except where, in certain cases, distinction is aimed at. In the small type, where head-line reduces clarity, it may be dropped.

(2) The letters may be written in the order of pronunciation.

(*a*) The short ' i ' sign (◌ि) may be written before the consonant till a satisfactory solution is found.

(*b*) The *mātrās* for vowels ए, ऐ, ओ and औ may be placed on the top, but after the consonants on the right as दे॑वता, अै॑कणे, आे॑ला, आै॑रत.

(*c*) The signs for ' उ, ऊ ' and ' ऋ ' may be written in the same line and after the consonant : कु॒टील, पू॒जा, सृ॒ष्टि.

(*d*) The sign for *anuswār* and *anunāsik* may be written after the letter as अं॑श for अंश.

(*e*) The half ' र् ' expressed by *rafār* (◌्) may be written in order of pronunciation as धर्म for धर्म.

(*f*) In conjuncts ' र् ' coming as second consonant, may be written in full form as in प्रकार for प्रकार, त्रण for त्रण.

(*g*) In conjuncts, the consonants may be placed one after the other. द्वारका for द्वारका, विद्वत्ता for विद्वत्ता, समाप्त for समाप्त.

(3) The *swarākhadi* or *barākhadi* of ' अ ' may be adopted in place of the existing style of writing separate symbols, i.e. अि, अी, अु, अू, अे, अै for इ ई उ ऊ ए ऐ.

(4) In the languages spoken in the South short ' ए ' and short ' ओ ' are used. They may be represented by placing the *mātrā* in a little different way.

(5) The full *anuswār* may be represented by open dot ' ◦ ' and *anunāsik* by dot (◌॑) i.e. सि◦ह, चांद. ङ्, ञ्, ण्, न् म् may be written as

च°चल for चञ्चल, प°थ for पन्थ, प°प for पम्प, except in cases such as वाङ्मय, तन्मय, etc.

(6) *Nuktā* or a point under the letter, may be used to denote separate pronunciation such as क़ ख़ ज़ झ़ in Persian, च़ in Marathi and ज़ in Sindhi.

(7) The punctuation marks may be used as in English except that *charan-regh* ।, (*Pai*) may be used for full-point.

(8) The figures may be written in the Bombay style :

१, २, ३, ४, ५, ६, ७, ८, ९, ०.

(Later in the Sub-Committee meeting, dated 5th October 1941, it was decided to retain the Hindi fo rm of figures ५ and ६).

(9) It is necessary to replace the 'ख' with 'ष'.

(10) The Bombay style letters 'अ, झ, ण' may be used for अ, झ and ण while the Hindi style letters ल श may be used for ल and श. 'क्ष' may be used for 'क्ष' except in Algebraic writing where 'क्ष' may be used.

(11) The letter 'ळ' may be added for writing the Marathi, Gujarati, Kannada and Tamil words.

(12) Since there is difference in the pronunciation of 'ज्ञ' its present form may be retained. Both forms ओ३म् and ॐ may be used. श्री may be written as श्रि or श्री.

(13) Conjuncts may be made by removing the verti-bar from the letters having one. The half-forms of क and फ may be written as क and फ. The conjuncts of the letters with short-bar छ, ट, ठ etc. may be made by placing a joining sign (hyphen), i.e. विठ-ठल, उच्छ-वास बुड-ढा, ब्रह्-मा.

(14) भ and घ may be differentiated from म and ध by using a revised design with a loop भ, ध.

3. Baroda State Script Reforms Committee (1936)[3]

The report of the Script Reforms Committee appointed by the Boroda State Government has been published in the State Gazette of 2nd July 1936. The object of setting up this committee was to recommend a common script for Hindi, Marathi and Gujrati. The fact that in the absence of a common script inter-State exchange of views and undertaking becomes difficult, has been accepted in the Royal order. The committee set up the following aims and objects of script reforms :

(*a*) A common script will bring the Hindi, Gujarati and Marathi-speaking people together.

(*b*) The 'look' of the current script should not be altered beyond recognition.

(*c*) Reforms are aimed at the facility in writing and printing.

(*d*) The beauty of the letters should be preserved.

The Committee made following recommendations :—

(1) The head-line may be removed.

(2) The vowels इ, ई, उ, ऊ, ए, ऐ, and ऋ may be replaced with *swarākhadi* of अ.

(3) The vowel-signs may be placed after the consonants, slanting towards right, i.e. सेवक, सुचक.

(4) The vowel-signs may be set up according to the order of pronunciation except that the short इ sign ि may be retained till satisfactory solution is found.

(5) The conjuncts may be set in linear style, i.e. द्वारका

(6) The verti-bar may be dropped when the consonant is used without a vowel.

(7) The consonant forms of क and फ should be क, फ,

(8) Short-bar letters may be used in conjants with a joint ◌्

(9) The *halanta* sign may be used for consonant-ending words.

(10) The *Reph* (◌) may be replaced with र् i.e. कार्य-कार्य.

(11) The *anuswār* be placed after the consonant i.e. संशय संशय

(12) 'Half' *anuswār* may be indicated by consonant, i.e. ङ, ञ, etc.

(13) *Danda* or *Khadi-pai* may be used for fullpoint.

(14) All other punctuation marks may be continued.

(15) The letter अ, झ, ण, be wirtten in the Bombay style अ, झ, ण,

(16) The Hindi form श may be used.

(17) The Hindi-Gujarati form of ल be used in preference to ल.

(18) Devanagari ख be replaced with old Marathi-Gujarati form ष.

(19) The short ए and ओ occurring in the South Indian languages be indicated by a horizontal *Mātrā*.

(20) The figures may be written in the Bombay style.

(21) A dot may be placed on the left of the letter to indicate different pronunciation, i.e. .क, .ख, etc.

(22) The current forms of ॐ, श्री, and ज्ञ may be retained. क्ष may be written as क्ष except in Mathematics.

4. Government of Bombay (1939)[4]

Fresh attempt to standardise the Devanagari at State level was made in 1939 by the then Bombay Government when the following resolution was issued :

The type to be used in the Devanagari edition of the Hindustani text-books should be that which is used in the Hindi publications except for the following necessary alterations :

(1) The letters अ, झ and ण must be of the Bombay type.

(2) The letters ल and श must be of the Calcutta type ल, श, (which is known as the usual Devanagari type).

(3) In order to express the different pronunciations of the following Urdu letters a dot should be placed under them :

ख ज़ श ड़ ढ़ क़ ग़

(4) The figures of the numbers must conform to the Bombay mould.

०, १, २, ३, ४, ५, ६, ७, ८, ९.

Following is the table of the letters :

Table 84. **Table of letters showing alternate letter forms.**

अ	must be	अ	(Bombay type)	ल	must be	ल	(Calcutta type)
आ	,,	आ	,,	श	,,	श	,,
इ	,,	अि	,,	ख	,,	ख	
ई	,,	अी	,,	ज़ ज़ ज़ ज़		ज़	
उ	,,	अु	,,	क़		क़	
ऊ	,,	अू	,,	फ़		फ़	
ए	,,	अे	,,	ग़		ग़	
ऐ	,,	अै	,,	ड़		ड़	
ओ	,,	ओ	,,	ढ़		ढ़	
औ	,,	औ	,,	ज़्ह		ज़्ह	
अं	,,	अं	,,	स स स		स	
अः	,,	अः	,,	ण		ण	
झ	,,	झ	,,				
ण	,,	ण	,,				

The transcription of the Hindi words like *prakār*, *kṛipā*, etc., should be made thus : प्रकार پرکار कृपा کرپا प्रेमी پریمی i.e. the first letter should have a *jazm* over it in order to help the students in forming the correct pronunciation.

In the particular cases of conjunct consonants mentioned below, the component letters should invariably be placed one after the other in the order of pronunciation linearly when the following changes will take place in the usual letters :

The letter having a pai (i.e. a perpendicular stroke as in ग, म, प, स, ख, घ, च, ज, झ, ञ, त, थ, ध, न, प, ब, भ, य, ल, व, श, स, क्ष, ज्ञ) where it forms the first letter of a conjunct consonant and is, therefore, half letter, should drop its pai and be joined to the next following letter, with the exception of र linearly.

In the case of क and फ their half forms would be क and फ respectively as the first letters of conjunct consonants. Hence,

शुक्ल	must be written as	शुक्ल	कृतघ्न	must be written as	कृतघ्न
प्राप्त	,,	प्राप्त	कुमाराप्पा	,,	कुमाराप्पा
अन्न	,,	अन्न	हिज्जे	,,	हिज्जे
पक्व	,,	पक्व	बच्चा	,,	बच्चा
मल्ल	,,	मल्ल	अश्व	,,	अश्व
शक्ति	,,	शक्ति	दत्त	,,	दत्त

When Yā-e-Marūf occurs in the middle of a word, it should be expressed by putting a short line under the two dots, e.g. نیلی (nīlī)= نیلی while *Ya-e-Mujhul*, by a *Jazm* over it, e.g. تھیلی (thail)ī= تھیلی

Waw Maruf should be expressed by an inverted *pesh* over it, e.g. دور (dūr) = دور

Nun-e-ghunna in the middle of a word should be expressed by an inverted *Jazm*, e.g. ہنسو (hanso)= ہنسو

Zer and *pesh* must be used to express the correct pronunciation of every difficult word.

5. Nagari Pracharini Sabha[5]

In its meeting held on 24/25 *Jyestha Samvat* 2002, the Script Sub-Committee of the Nagari Pracharini Sabha adopted certain principles governing the changes in the script.

(1) It is necessary to reform the Nagari script from the utilitarian point of view.

(2) New graphemes may be evolved to represent the phonemes from other languages, as well as from Hindi, which are not provided with symbols.

(3) While effecting the changes in conjuncts etc. for facilitating writing and printing, care should be taken to preserve the beauty of the script and not to change the face of the current script beyond recognition.

(4) Before finalising the changes, the efforts so far made towards the script reforms, should be studied.

The Sub-Committee later adopted the following line of action :

(1) To begin with the Devanagari should be reformed for Hindi and Sanskrit only.

(2) The design of the writing and printing scripts should not be different from each other.

(3) For facility in printing, the linear method may be adopted in arranging consonants. The *mātrās* may be placed after the consonants in the same line.

The Sub-Committee after examining the suggestions it received, recommended the scheme of Srinivas which is summarised in Appendix A at page 529.

6. Narendra Dev Committee (1949)[6]

The Government of U.P. appointed a Committee by an order dated 31st July 1947 to consider :

(*a*) the script-reforms suggested by the Nagari Pracharini Sabha,
(*b*) particularly from the point of view of their adaptation for composing, typing,
(*c*) its suitability for Sanskrit,
(*d*) the necessity of changes in the Devanagari script, and
(*e*) the facilities and usefulness of the reformed script for the languages other than Hindi and also languages like Marathi which use Devanagari alphabet.

The following was the composition of the Committee :

Chairman

1. Acharya Narendra Dev.

Members

2. Dr. Dhirendra Varma, Prayag University.
3. Pandit Ramshankar Dwivedi, Lucknow University.
4. Pandit Chandrashekhar Shastri, Principal, Shri Baladev Sahay Sanskrit College, Kanpur.
5. Pandit Bhau Shastri Baje, Brahma Ghat, Banaras.
6. Dr. Mangal Dev Shastri, Government Sanskrit College.
7. Rai Bahadur Pandit Shri Narayan Chaturvedi, Special Officer, Education Department (*Secretary*).

M. M. Pandit Narayan Shastri Khiste was later nominated on the Committee.

The Committee in its report stated that the number of the advocates of Roman script for Indian languages was increasing in the country. It was therefore necessary to reform the Devanagari script to adapt it to the new printing era. Such changes were not new. They have been made in the past. The general conclusions of the Committee in relation to the terms of reference are given in Chapter 9 of its report at pages 63 to 79 and are summarised below :

(*a*) The recommendations of the Nagari Pracharini Sabha are not acceptable *in toto* at this stage although some of them are useful, logical and scientific.

(*b*) Acceptance of the *Prati-Sanskrit Lipi* of Srinivas will create difficulties in actual practice as it would be necessary to learn it afresh. Although the number of types in it is much reduced, it is not acceptable for printing as its ' look ' is quite different from the current script.

(*c*) The *Prati-Sanskrit Lipi* is not suitable for writing grammatically correct Sanskrit.

(*d*) The change in the script should not be such as to make it necessary to learn it afresh. Within this limitation minor changes may be effected to facilitate its adaptation to mechanical composition.

(*e*) The reformed script will be useful for writing other Indian scripts such as Marathi and Gujarati.

Negative decisions of the Committee[7] are :

(*i*) The subtle difference of one *mātrā* and two *mātrās* (the time units) in the pronunciation of the vowels, may not be recorded in writing.
(*ii*) The *swarākhadi* of अ is not acceptable.
(*iii*) There should be no change in the vowel-*mātrās* except in short इ *mātrā*.
(*iv*) The consonants in conjuncts should be placed one below the other.
(*v*) Changes which are undesirable should not be accepted only for the facility of mechanical setting.

The positive decisions of the Committee[8] are :

(1) The vowel-*mātrās* may be placed after the consonants on the right, in their present design, i.e. कुंडल, कौंकयी, संपूर्ण.

(2) The open dot ° (*shunya*) may be used to represent pure *anuswar*. Except in cases like वाङ्मय, तन्मय etc. the nasals ङ ञ ण न म may be represented by the *shunya*. The *anunāsik* may be represented by dot ः i.e. हंसना, हंस.

(3) The head-line may be retained.

(4) The *mātrās* of ऋ and ऌ may be placed on the right in their present design.

(5) The conjuncts of the consonants with verti-bar may be made by removing the verti-bar ग→ग, र→ऱ (and not), वक्र=वक्र; धर्म=धर्म; वस्त्र=वस्त्र.

(6) Except क and फ, the consonants without verti-bar may be used with *halant* in conjuncts in their half forms, i.e. राष्ट्र=राष्ट्र विद्या=बिद्या ब्राह्मण=ब्राह्मण.

(7) The short इ *mātrā* may be written after the consonant. Its form will be modified by turning the *kānā* to make a loop at its foot.

(8) The script for composing shall be as detailed below :

(*a*) The vowel-*mātrās* of इ, ई, उ, ऊ, ए, ऐ, ओ, औ, अं, ऋ, ऌ, and the *halant* sign, may be placed on the right of the consonant to facilitate line composing.

(*b*) Diacritical marks may be used to represent the new phonemes.

(*c*) Conjunct forms of conventional design (क्ष, त्र, ज्ञ etc.) may be replaced in due course.

(9) Other recommendations of the Committee :

(*a*) The form of ञ shall be in the Bombay style ञ.

(*b*) The form of the consonants छ, झ, ण ध भ र ल and ह shall be as under :

छ, झ, ण, ध, भ, ऱ ल, and ह

(*c*) The short इ *matrā* shall be as: ि

(*d*) त्त and त्र may be written as त्त and त्र.

The revised alphabet shall be as under :—

१ २ ३ ४ ५ ६ ७ ८ ९ ०

अ आ इ ई उ ऊ ए ऐ ओ औ ऋ अं अः

क ख ग घ ङ, च छ ज झ ञ, ट ठ ड ढ ण

त थ द ध न, प फ ब भ म

य ऱ ल व श ष स ह ज्ञ ळ

(*e*) The punctuation marks as used in English may be accepted except the full-point for which the *Kadi-pai* shall be used. The marks shall be :

। - — , ; : ! ?

(*f*) The following signs may be provided on the typewriter keyboard :

. . . / ॰ ॰ % " " ( ) + × ÷ * = †

The fount of Devanagari according to the system of Dr. Gorakhaprasad[9] accepted by the Narendra Dev Committee is given below :

Table 85: **Founts of 110 types suggested by Dr. Gorakhaprasad.**

(*i*) Full letters			
	Vowels	अ, इ, ई, उ, ऊ, ए, ऐ.	7
	Consonants	क, ख, ग, घ, ङ च, छ, ज, झ, ञ ट, ठ, ड, ढ, ण त, थ, द, ध, न प, फ, ब, भ, म य, ऱ, ल, व, श, ष, स, ह, ज्ञ, ळ	35
(*ii*) Half letters		क, ख, ग, घ च, ज, झ, ञ ण ट, ठ, ड, ढ प, फ, ब, भ, म ह, ट, ल, व, श, ष, स, झ	26
(*iii*) Conjuncts		श्र	1
(*iv*) *Mātrās*		ा ी े ै ो ौ ं ः ृ ॄ ॅ	14
(*v*) Marks of punctuation		.. .. ..	9
(*vi*) Figures		.. ..	10
(*vii*) Miscellaneous		.. ..	8
			110

It is claimed that composing in the above fount can be done in 70 per cent of the time required for composing in the conventional fount.

The Narendra Dev Committee was not opposed to changes but it said that the changes should be gradual and that when they are brought about Devanagari will gain international acclaim.[10]

7. Bombay Script Reforms Committee (1949)[11]

The Government of Bombay appointed a Committee to suggest reforms in the Devanagari (*Bālbodha*) and Gujarati scripts consisting of the following members :

1. Acharya Kakasahab Kalelkar, Chairman.
2. Shri G. P. Vijapure, Karhad.
3. Shri Y. R. Date, Poona.
4. Shri Keshavram K. Shastri, Ahmedabad.
5. Shri Kishorlal Mashruwala, Wardha.
6. Shri Shivaji Narahar Bhave, Dhulia.
7. Shri H. K. Fhirodia, Bombay.
8. Shri Bachubhai Ravat, Ahmedabad.
9. Shri Dhirajlal C. Modi, Bombay.

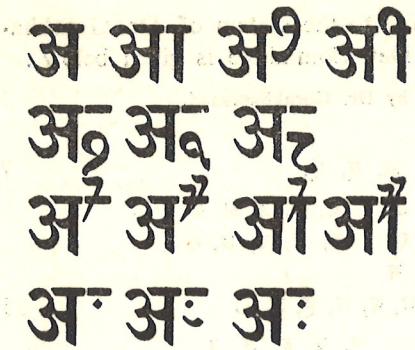

Fig. 197. **Vowels with the head-lines**

Reformed letters

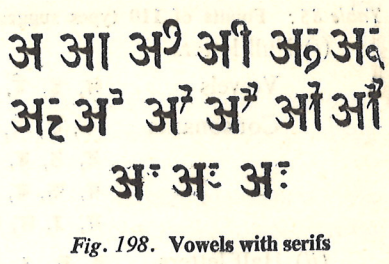

Fig. 198. **Vowels with serifs**

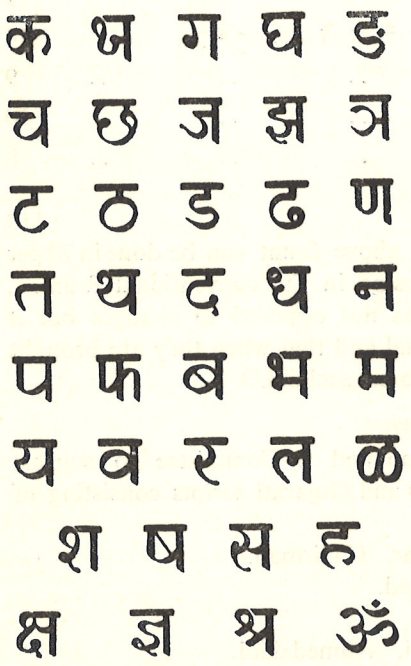

Fig. 199. **Consonants with the head-line**

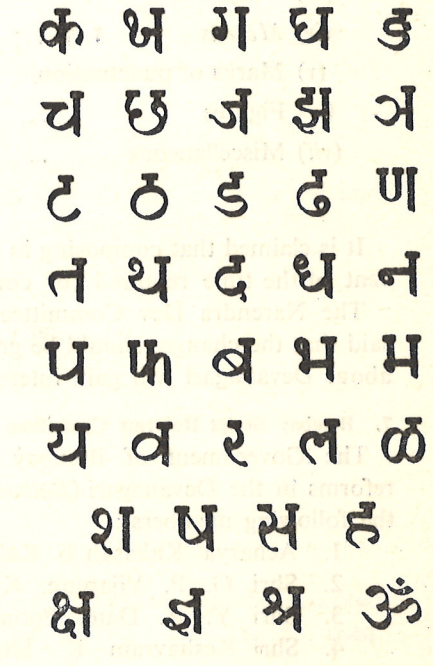

Fig. 200. **Consonants with serifs**

Prof. K. B. Vyas, Elphinstone College, and Prof. N. R. Parasnis, S. T. College, Bombay, were appointed Joint Secretaries to the Committee. L. S. Wakankar was appointed official calligrapher to the Committee. The recommendations of the Committee[12] are :

1. The design of the Devanagari letters should be such as it will render itself to the retention or removal of the head-line without creating any confusion or any difficulty in joining *mātrās*, etc. The head-line should be omitted from words and passages proposed to be emphasised.

2. The Devanagari letters may also be designed with serifs, i.e. by breaking the continuity of the head-line in words (*see Fig.* 200). Such letters can be used for emphasis. They may be introduced on typewriters first in order to popularise them.

3. (*a*) Devanagari घ and भ may be designed with a loop ध, भ.
(*b*) The Hindi ल with the verti-bar may be accepted in place of *Bālbodh* ल.

4. *Bālbodh* ख may be replaced with Gujarati ખ (*see Fig.* 199).

5. The conjuncts may be constructed by placing the consonants one after another, such as : रक्त = रक्त, शुक्ल = शुक्ल, क्रम = क्रम.

6. र coming as first consonant in the conjuncts is written as ⁼ or ° and in the full form coming as last member in the conjuncts is written as ˻ or ɾ. It may be written in the order of pronunciation in one form only. *Halant* र् is not recommended as the *halant* sign is likely to slip. Instead the half form ⁼ as used in ⁼हास may be used for the *reph*. i.e. सुर्यास=सुर्यास. Unaccented र् in conjuncts with य may be written with three-fourth च.

7. In order that writing may be according to the phonetic sequence, short इ *mātrā* should be placed after the consonants in a diminutive form of *kānā* ि.

8. It would be ideal to set up Devanagari in only one line instead of its present three-step arrangement. However, as the first step, the *mātrā*, *ukār* and *rukār* coming in the bottom line may be moved up in the central line. The white space which would be created by placing *ukārs* after the consonants may not be disturbing in Marathi and Hindi, owing to the presence of the head-line. This cannot, however, be said of Gujarati where there is no head-line. In order not to be far away from the conventional placement of *ukārs* under the consonants, it is suggested that they may be designed slightly descending below the base-line.

9. The hyphen sign may be attached to the letters without verti-bar such as ट, ठ, ड etc.; so that they can be joined with another consonant

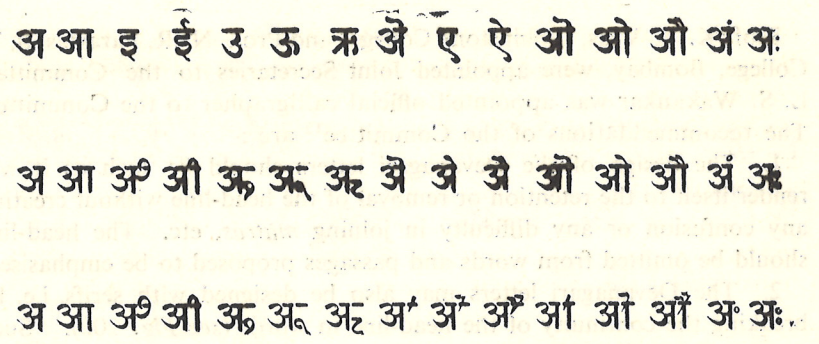

Fig. 201. **Kalelkar's suggestions on vowels and Vowel-signs.**

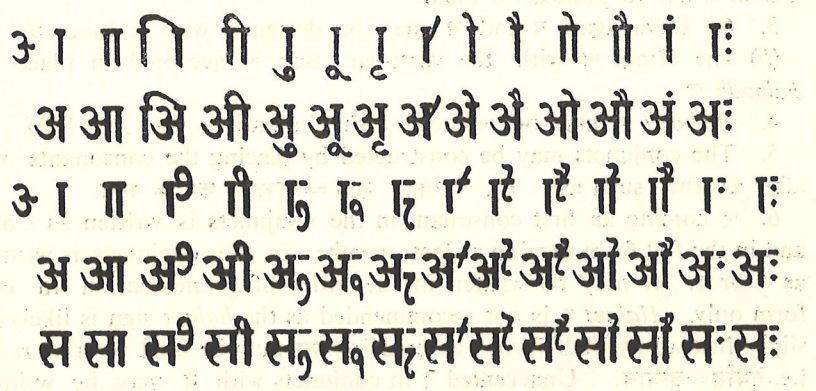

Fig. 202. **Kakasaheb Kalelkar's suggestions regarding linear setting of Devanagari.**

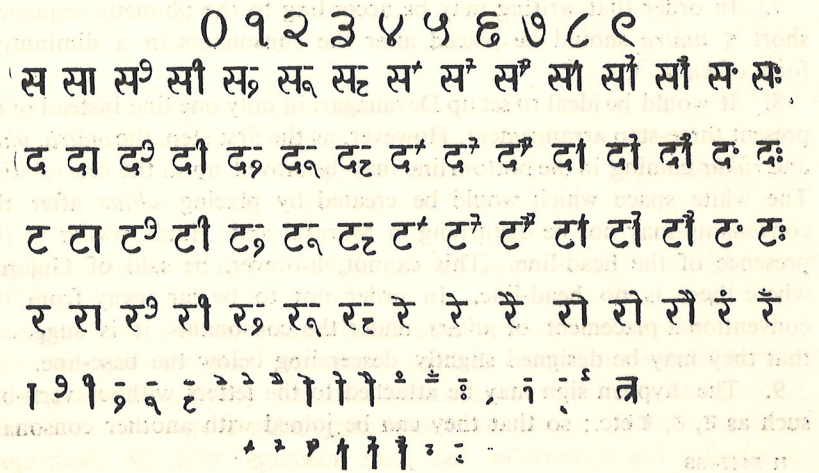

Fig. 203. **Kalelkar's suggestion on consonants-Vovel-sign combinations.**

to form conjuncts without using *halant*. Half forms of छ and ळ may be made by removing the joint to the head-line. The *swarākhadi* of अ may be used.

10. The Devanagari letters may be designed with uniform set-width for the typewriters. The Hindi style design of ण i.e. ए may not be accepted.

11. The designs ओ and औ in the form of *Bārākhadi* of अ are current in Marathi. Gujarati has accepted ओ and औ. The remaining vowels इ, ई, उ and ऊ may also be accepted in *swarākhadi* style, i.e. ि, ी, ु and ू. The *swarākhadi* of अ may be written as shown in *Fig.* 201.

12. A *nuktā* may be placed little before the consonant instead of placing it right below the consonant for expressing the linguals च, ज, झ.

13. The figure २ may be simplified. Design of figure ९ may be made horizontal.

Gujarati style figure 5, i.e. ५ may be accepted for Marathi. Figures ३ and ६ may be simplified by dropping the loop at the foot.

8. S. H. S. H. T. Committee and Parliamentary Committee (1951)[13]

Late Dr. Rajendra Prasad, the President of India, appointed a committee in 1948, on behalf of the Constituent Assembly, to report on Standardization of the Hindustani Shorthand and Hindi Typewriter of which the following were members:

Chairman

1. Shri Kakasaheb Kalelkar, Vice-President, Hindustani Prachar Sabha, Wardha.

Members

2. Shri M. Satya Narayan, Secretary, Dakshina Bharat Hindustani Prachar Sabha, Tyagaraj Nagar, Madras.
3. Shri Kripa Nath Mishra, Professor, Patna Science College, Patna.
4. Acharya Shri Sriman Narayan Agrawal, Principal, Govind Ram Seksaria Commerce College, Wardha.
5. Dr. Babu Ram Saksena, Principal, Kayastha Pathashala University College, Allahabad.
6. Bhadant Anand Kausalyayan, Secretary, Rashtra Bhasha Prachar Samiti, Wardha.

Prof. Balkrishna was appointed the Secretary to the Committee.

The Committee was charged with the task of reporting on (*a*) a suitable system of Hindustani Shorthand, (*b*) efficient arrangement of Keys for a Hindi typewriter, Teleprinting in Devanagari and (*c*) Reform of script. The Committee had joint meetings with the Devanagari

Script Reforms Committee appointed by the Government of Uttar Pradesh. It submitted its report to the President of India on January 17, 1949. This report was referred to a Parliamentary Finalising Committee, consisting of Kakasaheb Kalelkar as Chairman, and M. Satyanarayan and Dr. Babu Ram Saksena as members. The Committee reported to the Speaker on February 18, 1951.

The recommendations of these Committees are published by the Parliamentary Secretariat. They are summarized below as far as they relate to the script reforms.[14]

(*a*) The *velānti*, *mātra* and *ukār* may be written and printed after the consonants. This improvement may be executed in instalments beginning with *ukārs* or the 'bottom floor.'

(*b*) The *Swarākhadi* is accepted for ओ and औ. It is also accepted for अे and अै in the Gujarati and *Modi* scripts. This principle may be extended to अि, अी and अु, अू.

The Chairman, Kakasaheb Kalelkar, appended a note to the H. S. and H. T. Committee report.[15] Three charts (*Figs.* 201, 202, 203 and 204) are given in the report with descriptions thereof.

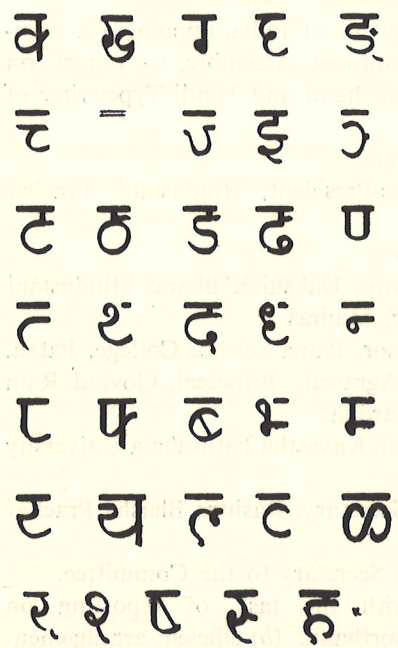

Fig. 204. **Kalelkar's suggestion of half letters**

1. The letters ख ध भ and ल may be written as ख or क्ष, ध, भ and ल.
2. The letters छ and श may be written as छ and श.
3. The contours of the letters र, ळ and ह may be made to conform to the general height and width of the Nagari letters.
4. The half forms of letters without *Kānā* ट, ठ, ड, ढ, द and ह may be written as ट- ठ- ड- ढ- द- ह- by using a link in *jod chinha*. *Halant* is called *Tod Chinha* (*see Fig.* 204).
5. The letter र and य change their form as last members of conjuncts, i. e. प्+र = प्र ; ट्+च = ट्च.

6. The vowel-marks for *Bārākhadi* may be reformed as shown in the second line and their ultimate forms are shown in the third line (*Fig.* 199). Note the addition of short अे and short ओ. Konkani uses a long अ which may be shown by raising the *pāi* or *kānā* upwards.
7. The vowel-signs, vowel-combinations and the numerals in the reformed style are shown in (*Fig.* 199).
8. The Rafar ◌ (*see Fig.* 200) may be replaced by the *halant* र्.
9. The middle row (in *Fig.* 198)* gives the alternate vowel-signs. They show short ◌ and long ◌ as also of ◌ (ष्ट्र) as they are accepted by the committee.
10. "It has been universally accepted that the present three-storied composing of *Nāgari*- letters is its greatest handicap. Vowel-signs for ◌ ◌ ◌ ◌ and the *anuswār* ◌ are written on the top of letters, thus creating the necessity of the top floor. The *reph* also occupies the top floor. The vowel-sings for ◌ and ◌ and the sign for ◌ as in राष्ट्र and the *nuktā* are placed below the letters, thus necessitating the bottom floor. It is accepted that these vowel-signs etc. should be written after the letters and not above or below the letters There is no objection if these vowel-signs go above the head-line as in the case of ◌ ◌ provided they do not come on the top of a letter.
11. "It is proposed, therefore, as the first instalment in script reform to remove the bottom floor by writing signs for short ◌ long ◌ and ◌ after the letters and not below them. This has been accepted by our committee and the U.P. committee. I have slightly changed the angle of ◌ so that they may look better and occupy some space after the letter. Otherwise the blank space becomes quite ugly, the vowel-signs must clearly show to what letter they belong. This shape is accepted by our committee as also by the Bombay committee.
12. " Further changes in the vowel-signs at the top are, as I said, mere suggestions, they can be considered when it is time for the second instalment in script reform.
13. " It is necessary even after accepting the reform of writing the vowel-signs after their letters, to make them go up the head-line and slightly below the length of the *pāyi*, to give relief to the eye and make them easy to read. "

9. Bihar Government on the decisions of U.P. Committee[16]

1. The recommendations of the U.P committee, that *mātrās* should be shifted to the right, avoiding the overlaps, will produce a disjointed effect and the writing will be offensive to the eye and straining to the mind.

It will mean enormous waste of space and of paper and stationery. It is evidently intended to eliminate dead keys; but dead keys have been avoided on the machine devised by the Bihar Government. The writing is normal. There is no waste of space and there is no disjointed effect. Bihar Government, therefore, do not support this recommendation.

2. It is agreed that there should be two different symbols (*Suddha Anuswār* " ं " *Anunāsik-svara* " ँ " but Bihar Government prefer to " write *Ganga* as गंगा " and not as ग◌ंगा, *Hansnā* (to laugh) not as हंसना as proposed by the U.P. committee, but as हँसना. It would have been preferable to have the *Anunāsik-svara* shown by ँ rather than by ं. But the latter is being suggested only because its use in connection with five different diphthongs (*Ardha-Vivrit*) sounds which have gained currency may be possibly obviated by adoption of 'ॅ' which has been adopted by the International Phonetic Association. Thus, while at present " College " is rendered into *Nagri* script as कॉलेज it would be written as कॅालेज if the symbol employed by the International Phonetic Association is adopted. If, however, the International Phonetic Association symbol is not adopted the 'ॅ' will still be available for five diphthongs and the *Anunāsik-svara* will use 'ॅं' with a dot on the top middle i.e. is, 'ॅं'.

3. Top bar (*Shiro-rekha*) should be used.

4. *Mātrās* for " Ree ", " Lree " need not be shifted to the right from the point of view of technical suitability of writing.

5. In case of letters which have a full vertical bar the half letter may be formed by removing the bar, with the exception that in case of " र " which as full letter, unattached to another consonant, should be continued to be written as र. As half letter it should be 'ɾ' at the top and as full letter joined to a half letter it should have the form ◌ placed at bottom.

6. Letters not having a vertical bar on the right should form the half letter by use of *halant*.

7. The Bihar Government do not agree to the suggestion that *mātrā* or " *Hrasva-ikār* " should be placed on the right and instead of the existing form " ि " a new form " ৷ " should be used. In no Indian language is the *mātrā* for short *ikār* written on the right. In Oriya, Tamil, etc. it is written at the top on the left. In fact it is wrong to imagine, on the analogy of Roman, that *Nāgri* character which is allied to the Bengali, Oriya and other scripts in the Sanskritic group of languages writes consonant first and vowel thereafter. Instead the unit of writing in Devanagari and other scripts derived from *Brāhmi* is a syllable and it is the syllable as a composite whole for which the symbol has been devised.

The symbol is called *Akshar* which means it cannot be broken further. The great merit of our forefathers was that syllables having similar vowel sounds came to be represented in a similar way which reduced the number of configurations required for our script. It could have been different as it became different in Chinese and some other languages where syllable with similar vowel sounds came to have entirely different representations. As soon as this is conceded, it would be futile to assert that *mātrās* placed on the right have any greater logic than *mātrās* placed at the top and at the bottom and on the left. When we have adopted *mātrās* for top and bottom, it is nothing illogical to adopt *mātrās* also on the left. It does not create any problem for mechanical writing and to put the *mātrās* for *Hrasva-ikār* on the right will be a most distasteful innovation without any good justification. It has only to be realised that tenacious opposition will be met if we suggested to Bengalis and Tamils to abandon their left *mātrās* which they use not only for ' ি ' but also for " ঁ ", " ঁ ", " ে " and " ৈ ". In fact for " ে " and " ৈ " they have to use *mātrās* both on the right and on the left. The attempt at uniformity is misconceived.

8. For new sounds diacritical marks should be used rather than new configurations devised. In particular use of diacritical marks at bottom will enable us to have a large number of Arabic and Persian sounds to be reproduced in Hindi. This is also the convention.

9. Independent forms for *Sanyuktākshar* should be done away with. This incidentally renders futile existing keyboards such as of Remington.

10. In *Svara* " अ " should be used rather than " অ ".

11. Bihar Government do not agree to the suggestion regarding the *mātrā* for " *Hrasva-ikār* ".

12. " क्ष " should be written as " क्ष " and " त्र " as त्र.

13. Punctuation as current in English should be adopted but for the full-stop the *Khadi Pai* should be used.

14. Bihar Government have no strong views regarding the suggestion that certain *Vyanjanas* should take a different form but they have suggested that there is no harm in continuing the existing forms. Their suggestions in this connection are indicated below :

Existing forms	अ	छ्र	छ	ण	भ	ल	श	क्ष	त्र	त्त	क्त	ज्ञ		ख	ध	र
U.P. Govt.	अ	छ्र	छ	ण	भ	ल	श	क्ष	त्र	त्त	–	ज्ञ	ग्य	ख	ध	ɾ
Bihar Govt.	अ	छ्र	–	ण	भ	ल	श	क्ष	त्र	त्त	क्त	ज्ञ		ख	ध	र

10. Government of Madhya Pradesh (1953) [17]

1. " It will not be possible for Hindi to spread quickly unless we adapt the Devanagari script to such mechanical contrivances as the typewriter,

the Monotype, the Linotype and the Teleprinter, for it is on the increased use of these contrivances that the industrial, cultural and scientific advancement of any country depends in the modern age. The problem is not without difficulties because these contrivances have been devised with an eye on the requirements of the Roman script, which differ considerably from Devanagari. It is, therefore, absolutely necessary *to effect improvements in these machines to suit our special requirements and make suitable changes in our script, where unavoidable.** There is little doubt that Devanagari script is basically scientific and phonetically sound ; yet it has to face the challenge of modern requirements of speed, mechanical facility and simplicity—a challenge which has been successfully met by Roman script particularly in the field of business, education and journalism. It is my conviction that Devanagari is capable of meeting this challenge with slight modifications in its form without sacrificing its basic character. To the last point we attach considerable importance as the language and script of a people are an expression of their distinctive character and are deeply rooted in their native genius. From accounts about similar efforts in Japan for the adaptation of mechanical devices for their own script, a very useful lesson can be derived. *As far as possible, the machine should be adapted to the script and not the script to the machine.** It is in this background, that we have to consider the question of effecting reforms in Devanagari script."

2. "In 1950, the Madhya Pradesh Government sponsored an all-India Conference which was inaugurated by Dr. Rajendra Prasad, then President of the Constituent Assembly, for standardization of Hindi vocabulary, spelling, grammar and script. Among other things, it was agreed in this conference that the general principle in standardizing the Devanagari script should be to retain the existing symbols and conventions as far as possible and yet adapt it for use on modern printing and typing machine either as such or with such slight alterations in the mechanism as are inexpensive and feasible."

3. "Our stand on the recommendations of the Narendra Dev Committee is as follows :

(*i*) We are in agreement with the Committee's view that any basic change in the character, form or symbols of the Devanagari script would shut out our future generations from our great intellectual and cultural heritage in the Devanagari script and cannot, therefore, be acceptable. We cannot agree to the Nagari Pracharini Sabha's proposed changes in the script.

* Italics mine : *Author.*

(*ii*) Kakasaheb Kalelkar's *swarākhadi* of अ is also not acceptable to us on the same ground.

(*iii*) The proposed changes regarding इ *mātrā* and र do not appear to be absolutely essential, although it is true, these would facilitate speed in typing. In spite of the inconveniencel it would be advisable to retain both of them in their origina, forms as two exceptions, in accordance with the principle already accepted of not interfering with the basic form of Devanagari script.

(*iv*) The forms suggested for अ and छ, झ, ण, ध, भ, ल and ह् are acceptable to us as also the suggestions regarding '०' for pure *anuswār.*

(*v*) We agree that क्ष and त्र can be written as conjunct क्ष and त्र, though perhaps it would have been more desirable if they could be retained as such.

(*vi*) The present form of the Devanagari script with the head-line should be continued, although in the cursive form, Nagari script without the head-line may also be permitted.

(*vii*) The suggestion to do away with independent conjunct forms and the use of *halant* is acceptable and the extra letters श्र, ओ३म् and ळ are also acceptable.

(*viii*) For new sounds, diacritical marks rather than new signs should be used where necessary. For the present, however, the use of diacritical marks need not be encouraged in the interest of simplicity.

(*ix*) The punctuation forms and such other forms as asterisk, etc., current in Roman may be accepted in addition to the *pai.*

(*x*) Provision should be made for ड़ and ढ़ also.

4. We accept the principle to utilise the existing 90 channel Lino and commend for the consideration of the conference the scheme submitted by N. L. Prayagi (excepting the *swarākhadi* part of his scheme) for a Lino-keyboard of 90 main and 34 auxiliary keys.

5. The scheme for improving and simplifying Devanagari hand-composing given by Dr. Gorakh Prasad with the suggestions of the Narendra Dev Committee is acceptable to us in principle. In this connection, Shri Prayagi's improvements may also be considered.

11. Lucknow Conference (1953) [18]

An all-India Conference was called at Lucknow (November 28-29, 1953) under the presidentship of Dr. Radhakrishnan, when over sixty

delegates participated from fourteen States of the Union and a steering committee of the following distinguished delegates was elected :

(1) Pandit Govind Vallabh Pant, (2) Shri Morarji Desai, (3) Pandit Ravi Shankar Shukla, (4) Dr. Bidhan Chandra Roy, (5) Acharya Badrinath Varma (Bihar), (6) Shri Kakasaheb Kalelkar, (7) Acharya Narendra Dev, (8) Shri Omeskumar Das (Assam), (9) Shri Harekrishan Upadhyaya (Ajmer), (10) Shri Anant-Sbhayanam Ayyangar, (11) Shri Ramkrishna Rao (Hyderabad), (12) Dr. Raghuvir, (13) Dr. Dhirendra Varma, (14) Dr. Suniti Kumar Chaterji, (15) Prof. K. S. Ayyar (Lucknow University), (16) Dr. Babu Ram Saksena (Allahabad), (17) Shri Kakasaheb Gadgil, (18) Dr. Satya Narayan Sinha, (19) Dr. Sampurnanand, (20) Dr. Panna Lal, Delhi, (21) Dr. Kailas Nath Katju, (22) Dr. B. V. Keskar, (23) Shri Kamalapati Tripathi (U.P.), (24) Shri Vishwa Bandhu Shashtri (Punjab), (25) Shri Raj Bahadur, (26) Shri Hargovind Singh, (27) Shri L. M. Chakra Deo.

An exhibition of the work done in connection with the script reforms was arranged under the guidance of Shri J. Scheimel.

In his message Pandit Nehru advocated the use of two scripts, Roman and Urdu. Dr. Radhakrishnan opined that changes in the script may not be made only to suit the convenience of the composing machine and the typewriters. Dr .K. M. Munshi was of the opinion that extra simplicity may mar the dignity of the script.

The decisions taken in the conference regarding the Devanagari alphabet are :

(*a*) The forms अ झ ण ल and क्ष may be accepted in preference to ञ्र झ्र ण्र ल्र and क्ष्.

(*b*) The letter forms ख छ ध and भ may be accepted in place of ख छ ध भ.

(*c*) The letter 'ळ' may be adopted for all the Indian languages.

(*d*) The figures १, ५, ८ and ९ be accepted in preference to १, ५, ८ and ९.

(1) The following basic alphabet was thus adopted :

Vowels : अ आ इ ई उ ऊ ऋ ॠ ऌ ए ऐ ओ औ अं अः

Consonants : क ख़ ग घ ङ च छ ज झ ञ ट ठ ड ढ ण त थ द ध न
प फ ब भ म य र ल व श ष स ह ळ क्ष ज्ञ

Figures : १ २ ३ ४ ५ ६ ७ ८ ९ ०

(2) Use of head-line should continue.

(3) (*a*) All the vowel-signs will continue to be used in the present style except that of short 'इ'.

(*b*) The vowel-sign of short 'इ' should be placed on the right side instead of left.

(*c*) The design of the short 'इ' vowel-sign will be the same as the long 'ई' vowel-sign except that the vertical stroke should not extend full length, i.e. ि (कि).

(4) (*i*) Except full-stop and colon, the punctuation marks will continue as in English — , ; ! ?

(*ii*) The full-stop will be represented by *khadi-pai* । (straight line).

(*iii*) The following signs may be accommodated on the typewriter keyboard as far as possible :—

. / ° % " " ( ) + × ÷ * = †

(5) The conjuncts should be constructed in two ways :

(*i*) by removing the vertical stroke of the consonants, i.e., रू र् ह्न च् etc.

(*ii*) by attaching the *halant* sign to the first letter in the conjunct, i.e., ठ्ठ for ठ्ठ.

In case of "क फ and ह" when they are first in the conjuncts, the existing method of combination may be continued : वाक्य, फ्याड, सुसह्य.

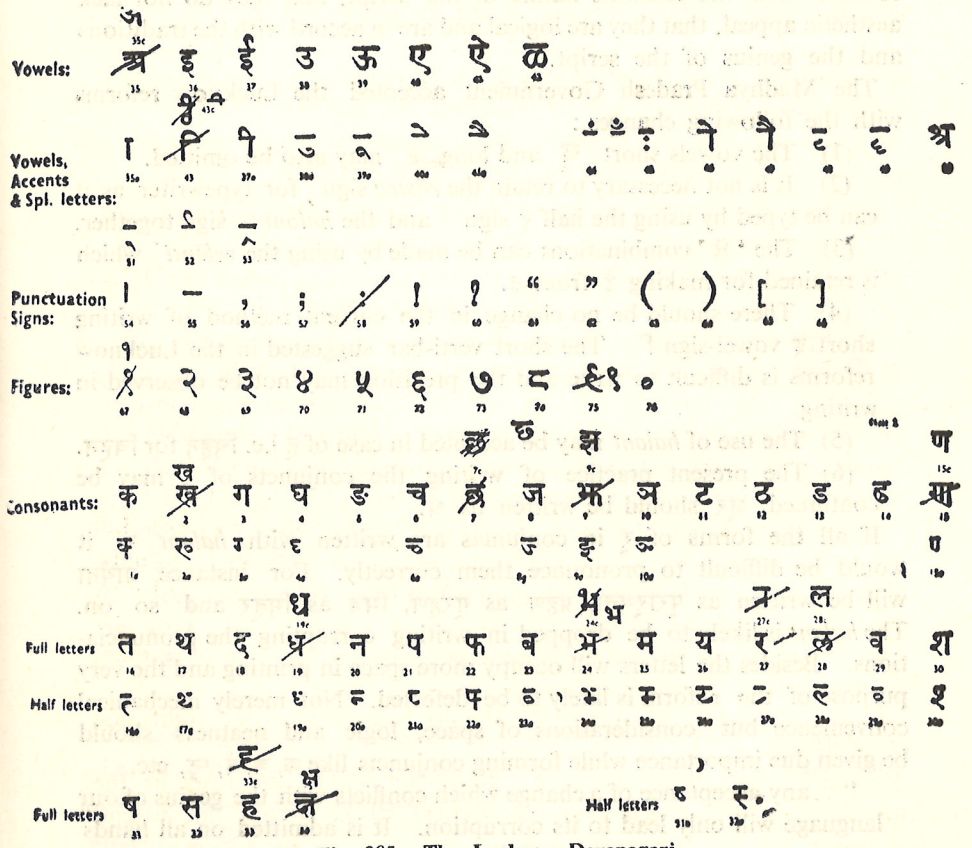

Fig. 205. **The Lucknow Devanagari**

(6) The suggestion to omit one of the two, *Anuswār* and *Anunāsik* should not be accepted.

12. Government of Bombay on the Lucknow Reforms, 1954 [19]

"Government is pleased to accept the recommendations made in accompanying resolutions adopted at the Devanagari Script Reform Conference held at Lucknow in November 1953. Steps should be taken to implement the decisions and to incorporate the changes in the Devanagari script *for purposes of Hindi* in this State."

13. Madhya Pradesh Government (2-10-1955) [20]

The comments of the Government of Madhya Pradesh on the Lucknow reforms are published in a pamphlet issued in October 1955. It asserts "One has to be cautious, that the reforms do not conflict with the scientific nature of the script, that they do not lack aesthetic appeal, that they are logical and are in accord with the traditions and the genius of the script."

The Madhya Pradesh Government accepted the Lucknow reforms with the following changes :

(1) The vowels short ऌ and long ॠ may also be omitted.

(2) It is not necessary to retain the *rāstra* sign ̂ for typewriter as it can be typed by using the half र् sign ◌ and the *halant* ◌ sign together.

(3) The 'R' combinations can be made by using the *velānti* ◌ which is retained for making ई from इ.

(4) There should be no change in the current method of writing short इ vowel-sign ि. The short verti-bar suggested in the Lucknow reforms is difficult to write and the precision may not be observed in writing.

(5) The use of *halant* may be accepted in case of ह i.e. चिह्न for चिह्न.

(6) The present practice of writing the conjuncts of र् may be continued. श्र should be written as श्र.

If all the forms of र् in conjuncts are written with *halant* र्, it would be difficult to pronounce them correctly. For instance प्रार्थना will be written as प्रार्थ्ना, ग्रहण as ग्रहण, मित्र as मित्र and so on. The *halant* is likely to be dropped in writing corrupting the pronunciations. Besides the letters will occupy more space in printing and the very purpose of the reform is likely to be defected. Not merely mechanical convenience but considerations of space, logic and neatness should be given due importance while forming conjuncts like क्र, त्र, र्ब, ष्ट्र, etc.

"..any acceptance of a change which conflicts with the genius of our language will only lead to its corruption. It is admitted on all hands that present Nagari is faultless and wholly scientific and is free from the defects found in other scripts. It provides a separate sign for each vowel and each consonant, and it is as a result of this excellence that our language has maintained its purity to the present day. *It cannot therefore be too strongly emphasised that if the purity of language is to be ensured it is the machines which should be adapted to the script. A research into this question is urgently needed** and there is not the slightest doubt that our unremitting efforts in this direction will demonstrate that the difficulties with which we are faced today can be surmounted."[21]

The Language Department of the Government of Madhya Pradesh has argued at length in favour of the use of the current method of writing short इ vowel-sign and the conjuncts of र्. In doing so the historical evidence is recorded which is made use of by the Author in an earlier Chapter.

The Language Department of the Government of M.P. was thus the first to critically examine the decisions of the Lucknow Conference. The decisions of the Government of Madhya Pradesh are listed in G.R., L.D. No. 1015-192-A-27, dated 2nd September 1955.

1. Vowels : (*a*) अ आ इ ई उ ऊ ऋ ए ऐ ओ औ अं अः
   (*b*) Out of the two forms अ and ॲ the form अ may be retained.
2. Consonants : (*a*) The new forms of ख, छ, ध and भ may be accepted, i.e. ख छ ध and भ.
   (*b*) The new consonant ळ may be added to the Nagari script.
   (*c*) Out of the two forms of ण ण, झ झ, ल ल, श श, and क्ष क्ष only one may be retained, i.e. ण, झ, ल, श and क्ष.
3. Numerals : Out of two forms ६ and ९ one may be retained, i.e. ९.
4. Head-line : The present practice of head-line may be retained.
5. Vowel-signs : The recommendations of the Lucknow Conference regarding the short i sign ◌ि may not be accepted. The current form ◌ि may be continued, i.e. कि and not की.
6. Conjuncts: (*a*) While forming conjuncts from letters with verti-bar, i.e.

   ख, ग, घ, च, ज, झ, ञ, ण, त, थ, ध, न, प, ब, भ, म, य, ल, व, श, ष, स and क्ष.

   Halant may not be used but the verti-bar may be removed i.e. उत्तर, मज्जन, गन्ना etc. (not उत्तर, मज्जन, गन्ना or उत्तर, मज्जन, गन्ना) (the form श्र may be used in श्र).

*Italics mine : *Author*.

(*b*) The present method of using the forms क and फ as first member in conjuncts may be continued, i.e. संयुक्त, दफ्तर (not संयुक्त, दफ्तर).

(*c*) ह may be joined as first member in conjuncts according to the present method and also by using *halant*, i.e. चिह्न or चिह्न (not चिह्न).

(*d*) While forming conjuncts from letters without verti-bar. ङ, ञ, ण, ठ, ड, ढ and द *halant* may be used, i.e. गठ्ठा, बुड्ढा, विद्या (not गठ्ठा, बुड्ढा, विद्या).

(*e*) The present method of forming conjuncts from र may be continued, i.e. नम्र, गर्व, राष्ट्र, श्रीमान्, पत्र (not नम्र, गर्व, राष्ट्र, श्रीमान्, पत्र).

7. Signs—The vertical line (*khadi pai*) may be used for full-stop.

8. The following punctuation marks may be used in the Nagari:

– — , ; ! ?

9. (*a*) In typewriting the following signs may be used:

. / ° % " " ( ) + × ÷ * = †

(*b*) The sign (◌ॅ) may be separated (◌ and ◌ॅ) for making conjuncts like त्र, ट्र etc.

(*c*) The rounded design of *halant* may be allowed to the short oblique (◌्).

(*d*) The र् in the *Rastra* sign (◌र्ा) may be made by joining (◌र) with (◌्).

10. The forms of *Anunāsik* Nasal mark and Nasal consonant ◌ं ङ ञ ण न म may be continued to be used.

14. Government of Bombay [22]

The Bombay Government commented on the Lucknow reforms as under :

(1) The forms " श " and " छ " are the improved designs of " श " and " छ " and should not have been discarded.

(2) The new form of रू is inconvenient in casting types and also printing.

(3) The use of the *charan-regh* for full-point is not convenient with use of English punctuation marks.

(4) The placing of the short ' इ ' sign ◌ि after the letters, though scientific, does not facilitate writing or setting.

(5) The loop of ' ध ' may fill in while printing.

(6) The *swarākhadi* of ' अ ' is in use for some years now. Gandhiji and Mashruwala are for it. It is convenient to write and should, therefore, have been retained.

(7) The use of *halant* may be alright for typing but will not facilitate printing. Certain words will look ridiculous thus स्वास्थ्य = स्‌वास्‌थ्‌य.

In this way the set-space will increase resulting in more consumption of paper. It would also be difficult to join *halant* to letters like क, फ and ह. If it is decided to join the *halant* mark with the letters, it would be necessary to cast all the letters with *halant* mark.

The Government of Bombay, however, accepted the Lucknow reforms for Hindi language in the State and further ordered that the text-books in Hindi must be printed according to the Lucknow style.

15. Maharashtra Mudran Parishad, 1958 [23]

The Lucknow Script Reforms were discussed in the Seventh Conference of the *Maharashtra Mudran Parishad* held at Dhulia in 1958. In a resolution adopted in this conference the following observations were made :

(1) The new design of " रू " is inconvenient to write and to print.

(2) The ' इ ' sign ' ◌ि ' with half *kānā* is inconvenient to write and would be difficult for the young students to recognise.

(3) The suggestion to use ' र् ' for all ' R ' combinations will result in wastage of space. It is, however, necessary to introduce uniformity in the ' R ' combinations.

(4) The use of *halant* in conjuncts will occupy more space.

(5) The number of types will increase due to the *ukāri* letters.

The Conference opined that the Lucknow script is more suitable for typewriting and it was necessary to effect necessary alterations for making it suitable for printing.

16. The Standard Script as accepted by the Government of India [24]

Government of India, Ministry of Education, accepted the final recommendations made by the Education Ministers' Conference on Standard Script with slight modifications.

1. The Alphabet :

(*a*) *Vowels* : अ आ इ ई उ ऊ ऋ ऌ ए ऐ ओ औ अं अः

(*b*) *Mātrā* (*Vowel-marks*) : ◌ा ◌ि ◌ी ◌ु ◌ू ◌ृ ◌ॄ ◌ॢ ◌े ◌ै ◌ॅ ◌ः

(*c*) *Consonants* :

क	ख	ग	घ	ङ		ट	ठ	ड	ढ	ण		च	छ	ज	झ	ञ
त	थ	द	ध	न								प	फ	ब	भ	म
य	र	ल	व	श	ष	स	ह	क्ष	ज्ञ			श्र	ड़	ढ़	ळ	

(*d*) *Figures* : १ २ ३ ४ ५ ६ ७ ८ ९ ०

Explanation :

Long ॠ does not occur in Hindi; therefore it is not included in the list of vowels.

2. Conjuncts :

(*i*) *Consonants with vertical stroke (Khadi Pāi)* :

ख ग घ च ज झ ञ ण त थ ध न प ब भ म य ल व श ष क्ष ज्ञ

When conjunct letters are to be formed from consonants having vertical stroke, the vertical stroke shall be deleted :

ख्याति, लग्न, विघ्न, कच्चा, छज्जा, व्यञ्जन, नगण्य, कुत्ता, पथ्य, ध्वनि, न्यास, प्यास, डिब्बा, सभ्य, रम्य, शय्या, उल्लेख, व्यास, श्लोक, राष्ट्रीय, स्वीकृत, यक्ष्मा।

(*ii*) *Other Consonants* :

(*a*) The present method of forming conjunct letters from 'क' and 'फ' be continued, e.g. संयुक्त, पक्का (and not संयुक्त, पक्का).

(*b*) Conjunct letters ङ, छ, ट, ठ, ड, ढ and द may be formed by adding plough sign of *halant* mark (The oblique stroke below a consonant), e.g. वाङ्मय, लट्टू, बुड्ढा, विद्या (not वाङ्मय, लट्टू, बुड्ढा, विद्या).

(*c*) The old three forms of र in conjunct letters be continued to be used, i.e. प्रकार, धर्म, राष्ट्र.

(*d*) The form of 'श' as it appears in 'श्री' may be retained.

(*e*) The conjunct letter त्र made from त and र be written as त्र.

(*f*) Conjuncts from 'ह' may be written by using *halant* mark as in the current method. चिह्न ओर चिह्न (but not as चिह्न).

(*g*) Sanskrit conjunct letters may be written in the old style.

4. The other decisions taken in 1953 will not change, i.e. (1) the use of head-line will be in force.

(2) (*a*) The punctuation marks, except full-stop, may be accepted as in English : , ; । ? ! :

The colon sign (:) may be used for '*visarg*'.

(*b*) For full-stop (.) vertical stroke (।) shall be used.

(*c*) As far as possible the following marks may be provided on the keyboard of typewriting machines :

ॅ ॰ ॰ % " " ( ) + × ÷ * = ॅ

(*d*) Nasal mark and Nasal consonant (ँ ङ्) will be continued to be used.

17. The Standard Devanagari Script as adopted by Government of Maharashtra [25]

Government of Maharashtra accepted the Standard Devanagari script with certain modifications :

Vowels : अ आ इ ई उ ऊ (ऋ) ए ऐ ओ औ अं अः

Mātrās : ा ि ी ु ू ृ ॅ े ै ॅ :

Consonants :

क	(ख)	ग	घ	ङ	च	(छ)	ज	झ	ञ	
ट	ठ	ड	ढ	ण	त	थ	द	ध	न	
प	फ	ब	भ	म						
य	र	(ल)	व	(श)	ष	स	ह	ळ	क्ष	ज्ञ	श्र

Numerals : १ २ ३ ४ (५) ६ ७ (८) ९ ०

1. *Conjuncts* :

Consonants with verti-bar :

ख ग घ च ज झ ञ ण त थ ध न

प ब भ म य व श ष स क्ष ज्ञ

While forming conjuncts from the consonants with verti-bar, the verti-bar of the latter should be dropped; as :

ख्याती, लग्न, विघ्न, कच्चा, सज्जा, माझ्या, व्यञ्जन, नगण्य, सत्ता, पथ्य, ध्वनी, न्यास, प्यादे, डब्बा, सभ्य, रम्य, शय्या, व्यास, श्लोक, राष्ट्रीय, स्वीकृत, यक्ष्मा.

2. *Other Consonants* :

(A) The present method of forming conjuncts from 'क' and 'फ' should be continued; as : संयुक्त, लफ्फा.

(B) The conjuncts from the alphabets ङ, छ, ट, ठ, ड, ढ, द, ल, ह and ळ except ल should be formed by using their *halant* form as and when necessary. The present method of forming conjuncts from 'ल' should be continued. च्‌ form should be used when the above consonants are to be conjoined with य, e.g. :

वाङ्मय, खट्टू, अड्डा, विद्या, पाल्य, गोळ्या, गोळ्या or गोळ्चा etc.

(C) The present forms of र in conjuncts should be retained, e.g. प्रकार, धर्म, राष्ट्र, वेंच्याने. There should be no objection to using the forms रु and रू instead of र्‌उ and र्‌ऊ.

(D) The form 'श' in 'श्री' should be continued.

3. (1) The practice of using head-line (शिरोरेखा) should be continued.

(2) (A) The following punctuation marks should be adopted :

. — , ; ! ? :

(B) In addition to this, the following signs should, as far as possible, be provided for on the typewriting keyboard and for mechanical and hand composing :

(ॅ " % " " ( ) + × ÷ * / = ॅ)

The Hindi forms of ख, ल, and श (i.e. ख, ल, श) were accepted by the Government of Maharashtra in a subsquent resolution.[26]

*Note : The letters, figures and signs in parenthesis differ from the Standard Devanagari accepted for Hindi.

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Appendix C

Dr. BHAGWAT ON EVALUATION OF THE DEVANAGARI CHARACTERS FROM THE POINT OF VIEW OF WRITING FACILITY

" It is seldom realized that the static character of Balbodh is due to its imperviousness to any structural modifications. The present structure of Balbodh came to be stabilized over six centuries back and ever since it has refused to admit of any basic changes. Perhaps one single factor which played a decisive role in shaping the structure of Balbodh was the material of writing available in those days. Balbodh was designed to be *scribed* in a hard surface like stone, metal or a tough tree-bark. This may be called the hard stage of writing-material. By its very nature this hard stage could only give out hard *inscripts* for being engraved in a hard surface. Such hard scripts required a considerable amount of pressure of cutting characters. And wedge-like straight strokes, angles and detached diacritics are easier for in-cutting than circles and curves. Balbodh possesses in a full measure these main characteristics of a hard script."

" Today a soft stage of writing-material has been reached. We now write with a pen or pencil ' on ' paper requiring the least amount of writing pressure. We *onscribe* and not inscribe. A soft script is needed for *onscription*. And rolling curvilinear shapes is the sole characteristic of a soft *onscript*. Balbodh was designed to be hammered in a hard-surface. The intervening centuries have brought about a complete change in the writing-material. But, there is no change in the structure of Balbodh, which goes ill with the soft material." [1]

Speed in writing Devanagari

" An average Balbodh letter has a speed of 59 points against the 91 of an average English letter."

" While structurally Balbodh letters are about 2½ times of a more complex nature than English letters, their capability for movement is in the ratio of 59 : 91, i.e. English letters are about 54 per cent more facile for writing than Balbodh letters." [2]

Dr. Bhagwat carried on an experiment in writing a Marathi passage of 117 words in five different scripts in order to test the speed which can be achieved. The result of the experiment tabulated by him is given overleaf [3]

Script	*Average time of writing*	*Speed in words per minute*
Balbodh	.. 9 minutes and 40 seconds	.. 12 words.
Gujarati	.. 8 minutes and 50 seconds	.. 13 words.
Modi	.. 6 minutes and 40 seconds	.. 17½ words.
Urdu	.. 6 minutes and 20 seconds	.. 18½ words.
English	.. 5 minutes and 30 seconds	.. 21 words.

" In a machine age, however, a script must answer to the needs of printing and typewriting as much as to those of handwriting. It is this factor of commonness of script for all types of writing which has brought back Balbodh to serve the scriptal needs of Marathi." [4]

Use of Diacritics

" Cursive Roman for English has two minor diacritics. A tick in ' t ', a dot in ' i ' and ' j '. Of these two, the tick is ordinarily blended with the body of the letter, and, thanks to scriptal redundancy, non-placement of dots over ' i ' and ' j ' rarely leads to illegibility. The natural run of Roman is not impeded by these diacritics."

" On the other hand, cursive Roman for Marathi is heavily saddled with bulky diacritics at both its flanks. The fit of 38 Marathi phonemes to just 26 Roman graphemes makes this improvisation inevitable. Our experiment shows that with these diacritics, Roman writes 21 Marathi words per minute for 12 of Balbodh. That, despite this diacritical drag, cursive Roman should write about 1·34 times faster is undoubtedly indicative of its superior scriptal mechanism." [5]

Perfect Alphabet and Marathi

" Phonemic system of a language has a number of sub-systems which are distinguished as vowels, consonants, stress, pitch, tone and other prosodic features. Alphabetic writings usually represent the vowels and consonants, sometimes tone and stress, but rarely other features. . . .

. . . The purpose of writing is to convey the exact thought content of the spoken word. The innumerable nuances of the spoken word need not encumber it in its graphic form. Any attempt to reflect fully the spoken word in writing will take away the simplicity of an alphabet. An ideal alphabet is one which has adequate provision for representing the vowels, consonants and other absolutely essential phonemic features of a language. Each phoneme should be represented by one grapheme and one grapheme should stand for one phoneme alone. A perfect graphemic fit with the phonemic structure of a language expects a one-to-one correspondence between its phonemes and graphemes. . . . Thus considered, Devanagari alphabet may reasonably be said to be phonemic for Sanskrit. However, *the very concept of ' phoneme ' rules out the possibility of its being*

adequately phonemic for all the middle and modern Indo-Aryan languages which are using that alphabet for their script. In Marathi, for example, we have seen that there are just six vowels and 32 consonants which have to find a place in a sound Marathi alphabet. 38 graphic symbols, judiciously chosen, are sufficient for this purpose. However, Marathi continues to employ all the 52 Devanagari symbols devised for Sanskrit; this is clearly an excess of 14 symbols. This excess has not unnaturally given more than one grapheme for some Marathi phonemes, e. g. /i/ or /ś/. And when there is no phonemic compulsion in the alphabet itself the alternative scriptal forms are often confused by writers. A lay Marathi writer is thus not always certain whether for the final /i/ in *vinanti* he has to use इ or ई or whether the sibilants in /vises/ are daggered (ष) or pegged (श). . . . Unless the phonemic base of the alphabet is adequately re-formed, this type of confusion will continue to exist. It looks as if the narrow-gauge stock of Marathi is set rolling on the scriptal broad-gauge of Devanagari entailing all the waste and disconform that it does." [6]

Phonemic Symbols in Balbodh

Table 86. **Phonemic symbols in the Balbodh alphabetical order** [7]

Vowels : 6

अ	आ	इ-ई	उ-ऊ	ए	ओ
a	ā	i	u	e	o

Consonants : 32

क	ख	ग	घ	ङ	
k	kh	g	gh	ñ	
च	छ	ज	झ		
c	ch	j	jh		
ट	ठ	ड	ढ	ण	
ṭ	ṭh	ḍ	ḍh	ṇ	
त	थ	द	ध	न	
t	th	d	dh	n	
प	फ	ब	भ	म	
p	ph	b	bh	m	
य	र	ल	व		
y	r	l	v		
श	स	ह	ळ		
ś	s	h	ḷ		

Diphthongs		Conjuncts			
ऐ	औ	क्ष	ज्ञ	ऋ	*visarga*
ai	au	kṣa	dnya	ru	ā

" English is eking out its graphic existence with just 26 Roman letters for its 36 consonants and vowels, not to speak of a few other essential phonemic features so characteristic of the language. Marathi has a wasteful excess of 14 graphic symbols while English is short of at least as many ! Thus, phonemically neither English nor Marathi has a sound alphabet. . . . In Marathi, unlike Sanskrit, length of vowels is not phonemic. However, Marathi employs for its script all the long and short vowel-symbols of Sanskrit resulting in vagaries of spelling at every stage. If the alphabetic coat of these languages is cut to their correct phonemic size, most of the present orthographical eccentricities, irregularities and complexities are likely to disappear for both." [8]

Scriptal Mobility of Roman and Devanagari

" Though the English alphabet has a very unsatisfactory phonemic basis, it commands scriptal mobility for all its letters. Any of its 26 letters is free in its standard form to combine with any other of the remaining 25 or to reduplicate itself. Thus the phonemic value of English letters a, i, u, c, t, s, etc., is mutable but the graphic forms of these letters are immutable. This has imparted perfect scriptal mobility to the English script. . . . Scriptal mobility has conferred on English vast possibilities of development in handwriting, printing and typing. . . . As for Devanagari, it serves as a good phonemic alphabet for Sanskrit, but compared to the English alphabet, it has a very low scriptal mobility. . . . Structurally speaking, the graphic signs chosen for Devanagari letters are all extra-size, ponderous, straggling and complex. Imagine for a moment that this principle of scriptal way as it works through the Roman alphabet. The two words प्रभू श्री. रामचंद्र would then appear as प्‌रअभ्‌उ श्‌रई र्‌आम्‌अ च्‌अन्‌द्‌रअ. (*Prabhu Shri Ramachandra*). Obviously, this is a graphic monstrosity, an impracticability in writing "[9]

" This orthographic capriciousness is increased by the awkward structure of Devanagari letters. A Devanagari writer is not always certain about (1) the allographic forms of phonemes and (2) their position and order in the script. For a truly phonemic script the simple rule should be to write the phonemes one after another in their natural sequence. This demands mobility for its alphabet. Even a glance at Devanagari consonantal allographs is enough to indicate that Devanagari does not possess this mobility so essential for an alphabet.

1	क्	क	क्ख	क्क	क	क्ष	क्त	ट	ट्र	ट्क	ट्ट	टच	ङ्ग
2	त	त्क	त्त	त्र	द	द्द	द्य	द्ध	द्र	न्द	द्ध	ध्व	
3	म	म्ब	म्ज	म्भ	श	श्च	र	र्क	क्र	र्च्य	श्र	ष्ण्य	
4	ह्न	ह्ल	ह्य	ह्व	व्ह	प्स	स्त्र	स्व	न्य्य	द्व			

In this way one comes across a number of allographs for a single consonantal phoneme and occasionally it is not rare for a writer to take liberty to bring in an altogether new allograph to suit the structure of the adjoining graphemes. *Devanagari alphabet is phonemic in conception, but the resulting script is syllabic in action.* Proper placement of allographs is the first concern of Devanagari." [10]

Phonemic Alphabet used for Syllabic Writing

" The phonemic Devanagari alphabet is grafted on the syllabic branch of writing. A syllabary is an outmoded form of writing now. It is at a much lower stage of evolution. It cannot keep pace with the requirements of writing in the modern world. The very appearance of ALPHABET, i.e. writing by acoustic impression, is to get over this difficulty. Once this fact about Devanagari is recognized, script reform in India will be real and objective. Shifting of a *mātrā* here and a slight change in a letter-face there is to give a very superficial treatment to the ailments of our script. No amount of manicure and pedicure is ever likely to put in any soul in an essentially inert body which is crying aloud for major orthopaedic surgery ! . . .

. . . When we are out to spread literacy among our teeming millions our prime requirement should be a streamlined script, basically the same for handwriting, printing and typing . . . .

. . . Our national script must be simple for learning, facile for writing, brief for composing and swift for typing." [11]

" Script is a conveyer to store and carry language over space and time. It is not an integral part of language ; it is external to it . . . .

. . . The technique of writing by sound, i.e. alphabetic writing, is slowly reaching perfection over centuries. Of the two essential features of a good script, the phonemic aspect has attained near-perfection for a few languages like Spanish. The other essential feature, viz., mobility of letters, has, however, not adequately engaged the attention of grammatologists. Very little experimentation has been done in the field and even widely used scripts like the Roman and Devanagari have yet to be fully analysed from this angle." [12]

Efficiency of Devanagari Graphemes for Writing

Dr. Bhagwat has carried out an experiment [13] by assigning graphemes of higher facility value to the more frequent phonemes. Although it does not appear practicable to effect such a radical change, the results of the experiment are very interesting. When the frequent phonemes such as *a*, represented by grapheme आ which takes more effort

to write, the work-load on the writer increases. In this experiment the work-load is calculated to 143·60 points. In the new arrangement आ is graphically represented by a simple grapheme ₹. By this change the work-load is reduced to only 57·44 points. The total working value of the present 38 Marathi graphemes is 668·78 points, while in the redistribution of letters the figure has come down to 485·13.

The above experiment reveals the fact that the evolution of the Devanagari letters has not taken cognizance of the frequencies of the phonemes even in the languages which they were invented to represent. Dr. Bhagwat has also worked out the advantages of writing Devanagari phonemes in Roman lower case letters. The findings in his own words are :

" The total working value of the 38 Marathi graphemes modelled after the 26 Roman letters is 258·94 points. Compared with the 668·78 points of the current Devanagari graphemes this works out very favourably. The function of 100 writing points is carried out by just 38 writing points. This is a clear saving of 62 per cent of effort and time currently spent in writing Marathi in the Devanagari alphabet." [14]

" . . . only the phonemic part of the grapho-phonemic principle has been applied to Marathi. The graphemic part which lays down that the most frequent phoneme should get the easiest letter has not been carried out in that Table. If the principle is fully applied to Marathi while yoking Roman letters to its script, the results are likely to be still more exciting." [15]

" Against the 258·94 points of Table XV, the new arrangement gives out only 174·85 points of writing-effort to put down 38 Marathi phonemes on paper. The function of 100 writing-points of Devanagari is fully achieved by less than 25 writing-points of Roman. It means a saving of 75 per cent of writing effort and time. In other words, Marathi will write three times easier and faster with 22 Roman letters scientifically correlated than with the present Devanagari alphabet." [16]

Accepting of Roman Alphabet

Dr. Bhagwat is alive to the problems which will have to be faced if the Roman alphabet is accepted for writing Indian languages. He therefore urges :

" The instance of Marathi language and the Roman script discussed in this chapter should therefore be taken as an illustrative

experiment rather than a categorical assertion that Roman is the last word in the matter of scripts whether for Marathi or for any other language." [17]

" Ease and speed in writing are as much dependent on the exact phonemic base of letters as on their compact size. Our study has indicated that the Roman letters do possess this compactness as compared to Devanagari letters which are straggling and ungainly. Roman is about three times more compact than Devanagari and it can be made exact to the phonemic requirements of an individual language. Besides Roman letters are mobile for writing. Phonemically, letters must be exact and mobile ; graphemically, they must be compact. The greater the degree of exactness and compactness of graphic signs greater is the promise of ease and speed for a script." [18]

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2. *Ibid*, page 164.
3. *Ibid*, page 171.
4. *Ibid*, page 172.
5. *Ibid*, page 173.
6. *Ibid*, pages 174-75.
7. *Ibid*, page 5.
8. *Ibid*, page 175.
9. *Ibid*, page 175-76.
10. *Ibid*, page 177.
11. *Ibid*, page 178.
12. *Ibid*, page 179.
13. *Ibid*, Table XIV, page 181 and Table XV, page 183.
14. *Ibid*, page 182.
15. *Ibid*, page 184.
16. *Ibid*, page 186.
17. *Ibid*, page 182.
18. *Ibid*, page 186.

APPENDIX D

STRUCTURE OF DEVANAGARI

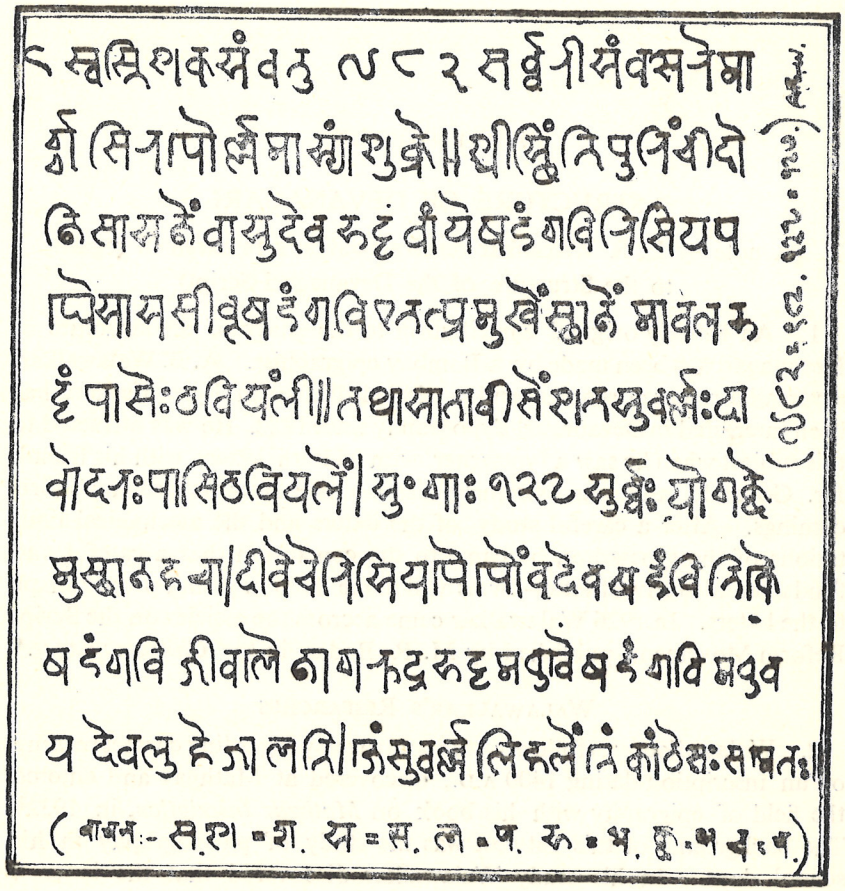
(A note by L. S. Wakankar on Walawalkar's research in regard to the Structure of the Devanagari Script)

1. An entirely original contribution to the study of the structure of Devanagari has been made by a Bombay epigraphist. A. B. Walawalkar, a versatile research scholar and a skilled draftsman by profession has been interested in Devanagari Typography since 1922. He was attracted to this subject when he saw a typewriter with Marathi letters, with his friend, Dr. Govande, and was extremely disappointed over its graphic shortcomings. After a careful study of the letters and the mechanical limitations of the typewriter, he came to the conclusion that a careful and fundamental study of letter-forms will alone help in giving proper shape to the letters. In 1926 Walawalkar came accross the articles on the Script Reform Movement, published by M. R. Bodas, in the *Chitramayjagat*.*

WALAWALKAR'S RESEARCHES

2. Walawalkar was following the controversy regarding correct reading of an inscription dating 1400 A.D., discovered at Mathgav and entered the field of epigraphy with his book on *Mathgav Inscription*, in 1932[1]. The background of this interest was the study of palaeography in his school days. In his study Walawalkar discovered that the letter न could only give the correct reading but it was inscribed as त without a dot inside. The dot in ङ and the form of ण in Modi, confirmed Walawalkar's idea of the evolution of the nasal from the first letter of the phonetic class. Walawalkar also saw that म was written by some scribes by attaching a loop to प and this was confirmed when he came across some MSS with Pandits of Rajapur and with Pandit Wasudeo Puranik Chikanye of Walawali. ञ in Modi Script was written by adding a dot to Modi च, Walawalkar therefore took up the study of Brahmi, the mother script of Indian scripts. The letters with verti-bar (*kānā*) in Devanagari, have deviated too much from the Brahmi, but the minority letters with dimunitive bar at the top (ङ छ ट ठ ड ढ द ह ळ) have maintained to this day, the

* *See* Appendix A, p. 492.



ॐ श्वश्ति शक संवतु ९८२ शर्व्वरी शंवत्सरे मा
र्ग्ग शिर पौर्ण्णमास्यां शुक्रे ॥ श्रीस्ठिंतिपुरिंची दो
नि शासनें वासुदेव भट्टवांये षडंगविरिशियप
धैसास शीवू षडंगविएतत्प्रमुखें स्छानें मालवभ
ट्टं पाशेः ठवियंली ॥ तथा सातावीशें शत सुवर्ण्णः दा
वोदरः पाशि ठवियलें । सु० गाः १२७ सुर्व्वः योगक्षे
मु श्छानहचा । दीवेचे रिसियपै पौंवदेव षडंवि तिकै
षडंगवि जीवणै नागरुद्रभट्ट मधुवै षडंगवि मधुव
य देवलु हे जाणति । जें सुवर्ण्ण लिहलें कांठेशः समेतः

Fig. 206. **Dive Agar Copper-plate 1960 A.D.**

Brahmi moulding. He realised that the suggestion of 'अक्षराणाम् अकारोऽस्मि' in *Bhagvadgita*, X-33 refers to the inherent 'Alif', the full verti-bar of ग ण श त न प म etc. or the small top-bar of the archaic letters ट ठ ड ढ etc. He further realised from inscriptional evidence, that the class ङ ञ ण न म of the *Māhesvari Sutras* is evolved from क च ट त प, the first letters, so also फ from प and ठ from ट.

3. The Dive-Agar copper plate (A.D. 1060) discussed by M. G. Dixit in "*Sahyadri*", June 1949, gives the clue to the evolution of म न ग श ण स छ ह य र and the *Mātrās*.* Further light was thrown on this subject when the *Serpentine* (नागबंध) inscription of the 10th/11th century from Bhojashala Dhar, was discovered. In these inscriptions, the *Pratyaya*-ending on the *Serpentine* chart are depicted with a single serpent entangling and the *Atmanepadi-parasmepadi* charts are depicted with entanglings of two serpents, the latter containing the *Mātrās* in place of vowels. These charts were given to A. B. Walawalkar by L. S. Wakankar of Dhar, whom he met accidentally in 1949 at a lecture meeting of Dr. S. Mahadi Hassan at the Prince of Wales Museum, Bombay. The forms of ब and ण of the Dem Bhoopal's Copper-plate of 1263 A.D. and the *Samāngarh* Copper-plate of 753 A.D. threw light on the evolution of *Pṛishtha-Mātrās* ; The copper-plates of Kadamb Kings of Goa are also in the Bharati style of inscriptions. †

Maheshvari Technique of Devanagari Writing

4. The study of the mysterious *Māheśvari Sūtras*, which provided a clue to the systematic technique of the Brahmi script, was the subject of a paper read by Walawalkar, first in Marathi at the Bharat-Itihas Samshodhak Mandal, Poona and then in English at the 15th Oriental Conference, held in Bombay in 1949. The organizers were not able to include the same in their publications, as it was a lengthy paper but allowed Mr. Walawalkar to publish it separately. After a proper revision it was published separately under the title "Pre-Asokan Brahmi" in 1951.

Walawalkar on Pre-Asokan Brahmi

5. Reconstructing the *Māheśvari-Brahmi* phonographs on the epigraphic background, A. B. Walawalkar published in his *Pre-Asokan Brahmi*, the guide-charts of *Māheśvari* technique, developing through *Paninian* Brahmi into the Bharati or Devanagari script in North India and the Telegu-Kannad Script in the Deccan plateau. The book carried a critical preface by Calligrapher L. S. Wakankar in which Walawalkar's

*See fig. 206 on opposite page.

† भारती लिप्याऽनयैव लिखितं पुराणंतु प्रशस्यते ॥ पद्मपुराण, पातालखंड, अ. १०० श्लो ५०.

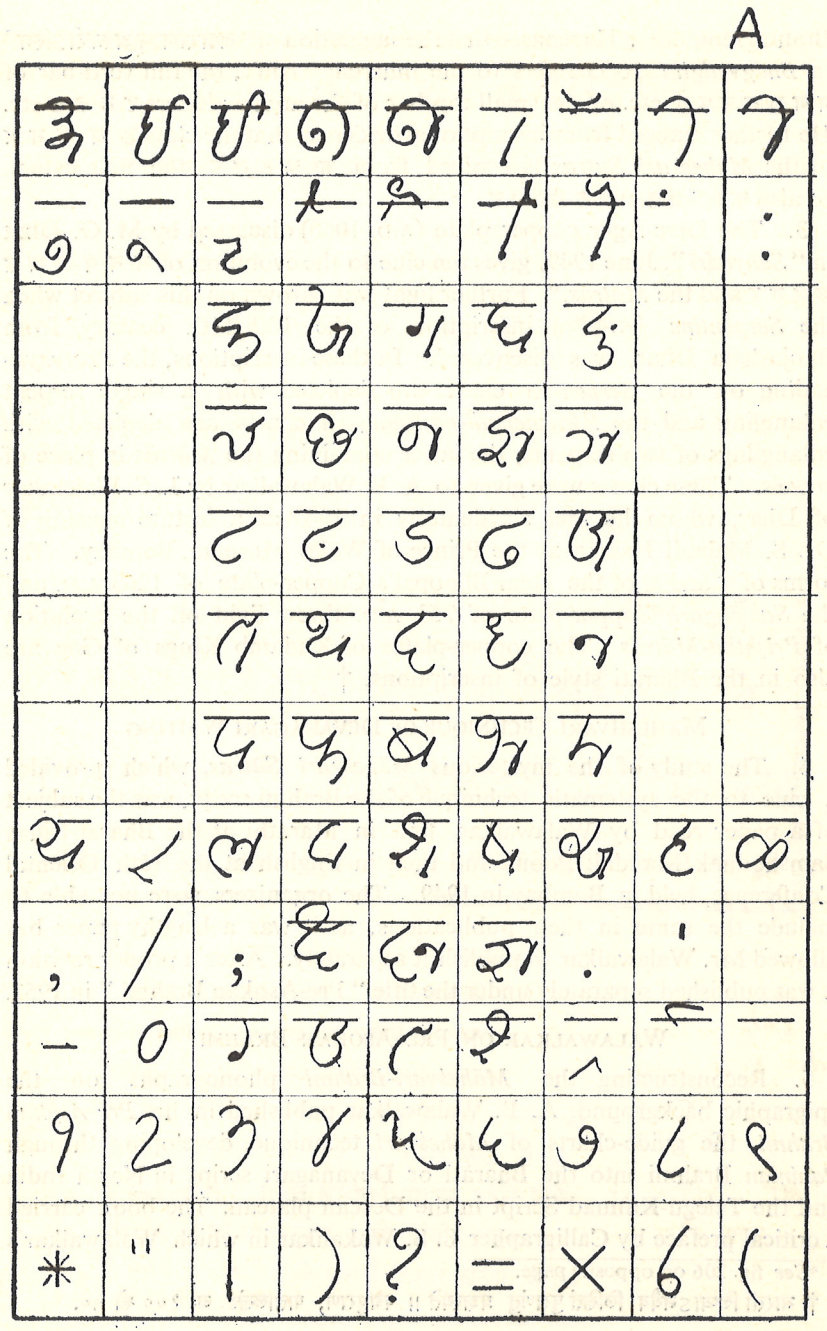


Fig. 207. **List of *Modi* characters for Marathi Typewriter (Balbodh).**

hypothesis was compared to the Mendeleffe's chart of periodic classification which forecasted the existence and properties of elements which were discovered later on and ended with his lexicographic references to Indian writing. The publication was hailed by scholars from India and abroad, and was mentioned in the Script Exhibition Bulletin, published in 1956, by the All India Library Conference held in Calcutta, together with the thesis by Dr. Buehler, Sir John Marshall, Pandit G. S. Ojha, Dr. Barnet, Rajabali Pande, Dr. David Diringer and Dr. Hasham.

6. Walawalkar endeavoured to discover and develop a Marathi typewriter. The Nagari characters recommended by him are simple, clear and suitable to the English typewriters of 42 keys. After sustained study of notation of every letter of the Indian scripts, he came to the conclusion that the *Modi* script of Maharashtra is the only script that can be used for alphabetic writing. He, therefore, set out to devise a 'Sulabha' *Modi* typewriter based on a script formulated by him from the Devanagari

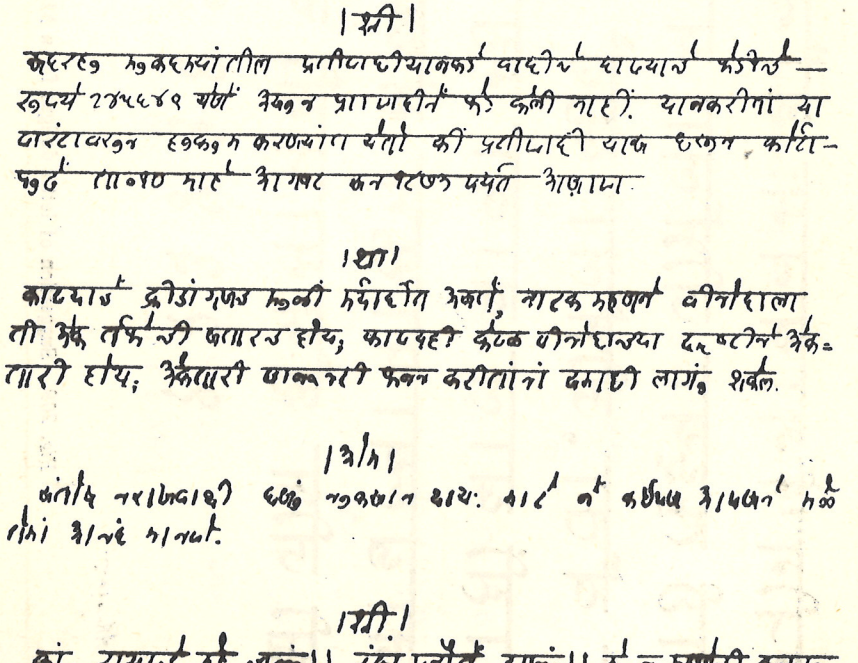


Fig. 208. **'Sulabha' script for Marathi, Gujerati and *Modi*.**

श्रीगणेशायनमः श्रीनामासीधं॥
"शाठी तुझ्या जीभेला पाय शाहेल?"
"छे बेता, जीभेला कुवँ पाय शसतात?
"नाहीं बाल बाबा म्हणत हाँते कीं,
-ऊजाबल्यापासून संध्याकाळपर्यंत
तुझी जीभ शेंबसारखी चाललेली शसते".
१२३४५६७८९०

Fig. 209. Suggestion of letter designs for a Marathi Typewriter, 1930.

महाराष्ट्री लेखनाचा नमुना.

नवीन रीत परचारात आणणारांनी कालचकराचा
कीतता वेतला पाहीजे जावजी दादाजी
ॐ॰ | नमो भगवते वासुदेवाय || येनाकषरसमामनायम-
धीगमयमहेश्वरात | कृत्सनं॰ व्याकरणमपरोकत॰ तसमै
पृथीपाणीनये नमः || अइउए | ऋलृक | एओङ | ऐऔच |
का॰ राया चरे दरेह याळूं॰ रंकापरउतरे॰ गाळूं॰ |
हरे॰ न म्हणरेची करपाळूं | पराण पइ॰ जा || जो
स॰. अजजुन बाजी वालावलकर, लीपीकार.

Fig. 210. Sulabha-*Modi* revised.

and *Modi* (*See* Fig. 207 and 208). This design was registered by him in 1940, but in the meantime the Bombay Government discarded *Modi* script in the Government offices and discontinued its study even in schools. Walawalkar, therefore, had to revise his Nagari scheme. He simplified the ' Sulabha ' script for application to the typewriter and the Monotype machine (Fig. 210). He produced two other schemes based on the medium of Nagari and Devanagari with independent *Mātrā* signs (Fig. 211 and 212). Some of the designs, though in crude form, are very

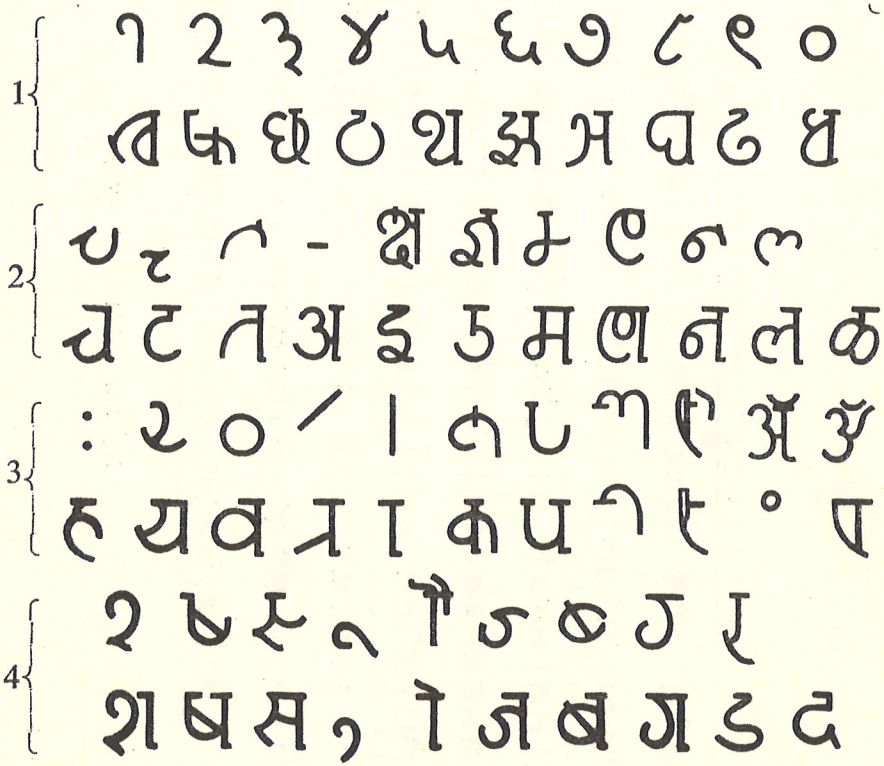


Fig. 211. **Walawalkar's Standard Nagari Typewriter keyboard layout, 1964.**

[*Note.*—The horizontal arrangement of signs conforms to the Māheshwari Sutras, making memorization easy.]

भारती संघ गीत

जय भारत जीस की कीर्ती सुत्रां ने गाइ।
हम हैं भारत संतान करोडों भाइ।।टेक।।

हां गूंज उठे आकाश अनील के पात्रा ।
अगणीत कंठों से बहे एक पवित्र धात्रा ।
कह दो पुकार कर सुने चराचर सात्रा ।
हैं भारत राष्ट्र स्वतंत्र अजेय हमात्रा।
अब तक भी है कुलकीर्ती हमारी गाइ।।१।।

बस इसी दीशा से प्रथम प्रकाश हुआ था।
शुभ साम गान से मोह विनाश हुआ था ।
पृथ्वी तल का पशुभाव हताश हुआ था ।
मानव कुल में मनुजत्व विकास हुआ था ।
हम से जीवन की क्रांती जगत ने पाइ।।२।।

सब कार्यों में हम सदा रहे आगे हैं।
विघ्नों के भय से कभी नहीं भागे हैं।
सदीयों से दीप हाथ हाथ भागे हैं ।
अब भी हमने वे भाव नहीं त्यागे हैं।
अब बारी है संसार हमारी आइ।।३।।

M.S.
By
A.B. Walawalkar
13 Burrows Lane
Bombay 2.

Fig. 212. **Walawalkar's Linear Devanagari.**

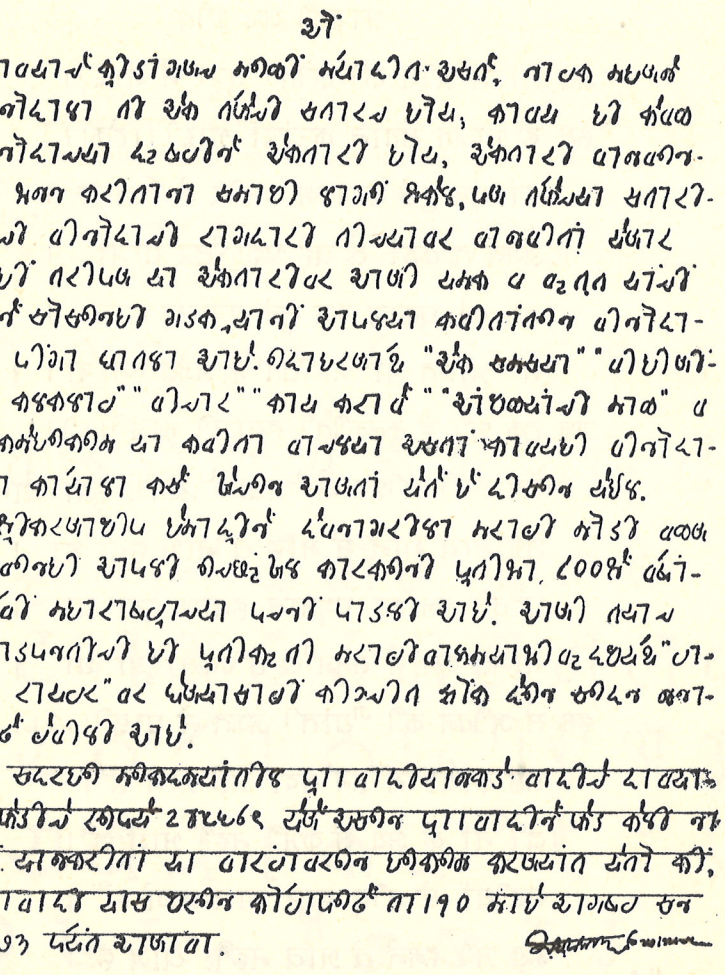


Fig. 213. **Walawalkar's version of *Modi* with and without head-line.**

कल्याणि लीपिचा नमुना

वैकुंठबासि श्रीनाराय-
णने शपने भक्तका छल
समझपत्र शंज फुकारा.

Fig. 214. **Kalyani Lipi I.**

कल्याणी लीपीचा नमुना

वैकुंठबासी श्रीनाराय-
णनेअपनेभक्तका छल
समझकर शंख फुकारा.

Fig. 215. **Kalyani Lipi II.**

Table 87. **Orient Script for Short Hand : Table of Consonants.**

CLASS	SIGN	DIRECTIONS	LETTERS OF NAGARI & ROMAN		AS SOUNDED IN SANSKRIT & HINDI	
GUTTURALS HARD	⌒	FORWARD	क	K	काकः	कोक
SOFT	⌒	,,	ग	G	गगनम्	गगनी
PALATALS HARD	⌒	UP & DN	च	CH	चर्चा	चाय
SOFT	⌒	DOWN	ज	J	जनः	जमाई
LINGUALS HARD	⌒	,,	ट	T	टीका	टट्टी
SOFT	⌒	,,	ड	D	डमरुः	डुगडुगा
DENTALS HARD	⌒	,,	त	T̤	तडित्	ततनी
SOFT	⌒	,,	द	D̤	दर्दुरः	दादरा
NASAL	—	FORWARD	न	N	नमनम्	नाणक
LABIALS HARD	⌒	,,	प	P	पपीः	पपीहा
SOFT	⌒	,,	ब	B	बिल्वम्	बाबत्
NASAL	|	DOWN	म	M	माया	ममता
SEMI VOEWELS	/	UP	य	Y	यमः	यात्र
,,	\	DOWN	व	W	वनम्	वानर
,,	|	,,	व्ह	V	व्हे	जिव्हा
,,	/	UP	र	R	रामः	राय
,,	⌒	UP & DN.	ल	L	ललितम्	ललक
,,	(	DOWN	ह	H	हरः	हात
SIBILANTS	)	,,	स-ष	S	सामः	साँस
,,	)	,,	श	SH	शशीः	शशक

Table 88. **Table of Nasal Compounds.**

GUTTURALS HARD & SOFT	—	FORWARD	ङ् ङ	NK, NG	शङ्कुरः; भङ्गः	संका; गंगा
PALATALS HARD	/	DOWN	ञ्च	NCH	मञ्चकः	चंची
SOFT.	/	,,	ञ्ज	NJ	कुञ्जरः	जंजाल
LINGUALS HARD	⌒	,,	ण्ट	NT	कण्टकः	उण्ट
SOFT.	⌒	,,	ण्ड	ND	अण्डम्	चण्डु
DENTAL HARD	⌒	,,	न्त	NT̤	अनन्तः	दन्त
SOFT.	⌒	,,	न्द	ND̤	मन्द्	छन्द्
LIBIALS HARD & SOFT	|	,,	म्प म्ब	MP, MB	कम्पः अंबा	कम्बल

interesting and exhibit a novel but scientific approach to the Devanagari typography. Walawalkar suggested a printing type for ministerial work (Fig. 214 and 215). He has also invented a short-hand script for the use of Indian languages, which deserves close study (Table 87 and 88).

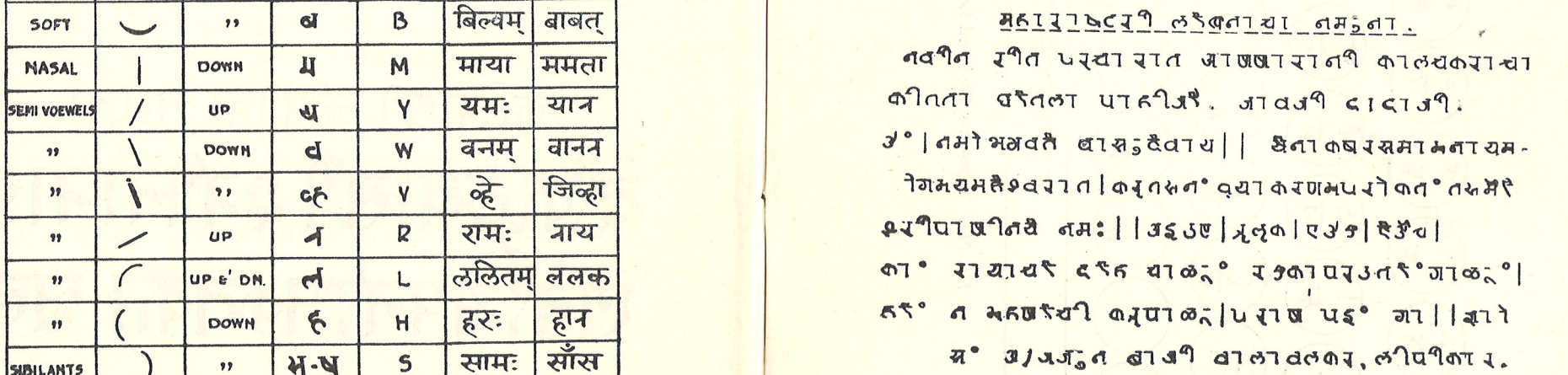


Fig. 216. **Sulabha *Modi* of 1929.**

7. The work of Shri Walawalkar remained unnoticed as he worked far away from the scholarly world. Particularly, since 1946, he devoted himself to the transport problems of the city of Bombay and the Maharashtra. He is considered an authority on Railway Projects, Yards, Docks and Plants and their colony layouts, in India. He has participated

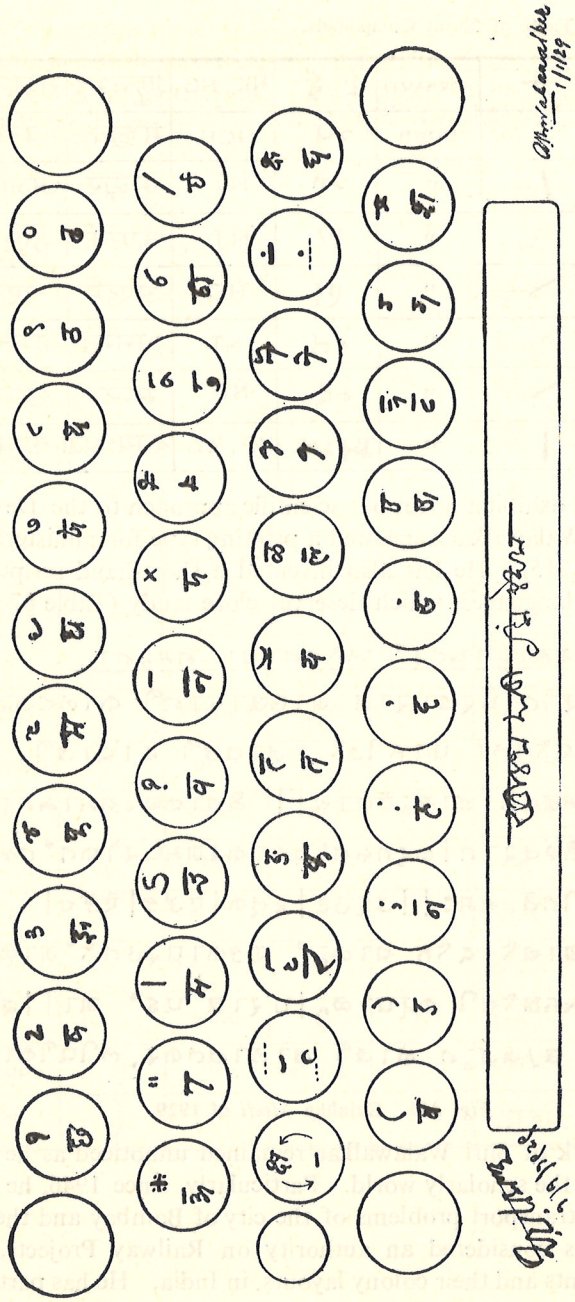


Fig. 217. Typewriter Keyboard Layout suggested by Walawalkar.

in formulation of various schemes for the development of Bombay and Maharashtra. Among these schemes, the ' Konkan Railway ', ' Churchgate-Museum under-ground Railway ', ' Quadrupling rails between Grant Road and Churchgate ' and ' Mahim-Kurla Connection ' on the Central Railway in Bombay, are highly appreciated in well informed quarters. Walawalkar at an advanced age had to divert his attention to the subject of Typography of Devanagari, owing to the pressure brought on him by his friends.

8. Walawalkar believes that there is no necessity to change the ancient Devanagari script at this stage of its development. It has reached a respectable standard in Indian Literature. Any modification in the Devanagari syllabary would deprive the Indians of the vast literature, ancient and modern very soon and would be a great loss which India cannot afford. No further modifications to Nirnaya-sagar Devanagari would be tolerated, he says. It is a treasure-trove of Bharat and must be preserved with the Sanskrit literature permanently. He warns that for Maharashtra the *Modi* script is the only solution and must be re-introduced very soon. *Modi* is a script that helped Maharashtra in the days of its political supremacy and it need not be discarded, ' Sulabh *Modi* ', Walawalkar hopes, would bring Maharashtra on the right path.*

[*Note.*—The maheshvari chart prepared by Walawalkar is reproduced in Fig. 7 at Page 50. The technique of Brahmi letters is illustrated in Plate 31 at the end of Chapter III.]

*सुलभा मोडी टंक लेखिका, *Vividha Vritta*, April 13, 1941.

A Note on Djokha (Umma) Seal of Telloh by A. B. Walawalkar

(*Epigraphic Relic of Brahmi Writing of Twenty-fourth Century B.C.*)

(1) Brahmi script of the third millennium B.C. has been discovered among the archæological finds in the Assyrian excavations in Mesopotamia at Telloh (Lagash). A site in the extreme south of Sumer, has furnished monuments anterior to 3000 B.C. The find is a clay tablet similar to those found at Mohenjo-Daro and Harappa of the Indus Valley civilization. It exhibits a specimen of true Brahmi writing explored by the author in his "*Pre-Asokan Brahmi*", a booklet published in 1951. The tablet is in dual script, with Indus Valley ideograms and a picture of a standing ox or buffalo, with a cane basket and stand in front. There are four Brahmi letters, followed by two ideograms of the Indus Valley script, in a sentence written from right to left, very distinctly according to the Brahmi technique of the phonetic notation. Here is the evidence of Indian Epigraphy, contemporary or perhaps earlier than the Indus Valley script, and certainly prior to any linear script, such as the Aramaic, Phoenician, Greek, Etruscan, etc., or even the pictographic writing of Egypt by a thousand years.

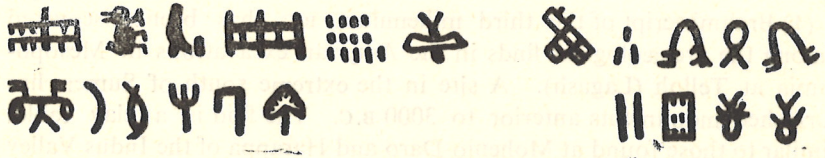
(2) This wonderful find was already published by Sir John Marshall in his second volume on the *Indus Valley Civilization*, after the excavations carried out between 1922-27 in Sind under him, as the Director-General of Archæology in India. Sir John Marshall could not make out its meaning, but published this tablet in his second volume, to show some evidence of Indus Valley script and tablets found, in earlier excavations, carried out in Mesopotamia in or about 1921. Sir John writes about the tablet in his post-script to the publication.

(3) The impression on clay of a similar seal was found at Djokha (Umma) near Telloh, a site which has supplied no antiquities later than the twenty-fourth century B.C. This seal has the usual horned bull over a bowl-shaped stand sur-mounted by a box as in Seals 40 and 115. The reverse of this clay tag from Djokha is impressed with another seal bearing the same simple design of a surface ruled in small square as found on the Indian seals.* Professor Scheil, however, thinks that this is only the impression made by a coarse cloth.

*See Revue d' Assyriologie, XXII, 56 and compare Seals 524, 525, 526 and 528.

The inscription on the Djokha seal is as under :

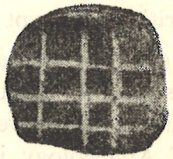
Here the text ends with the post fix No. 96. *



(4) Sir John also remarks that this seal and the other four found in the temple of the war-God, Ilbaba, at Kish, may have come to Mesopotamia and Elam from outside and are *pre-Sargonic*, that is, earlier than the twenty-eighth century B.C. Consequently the civilization of the Indus Valley may be as old as that of Sumer and Egypt. (Please see the pictures of the Indian Seals Nos. 115, 40 and 524 reproduced below) :

Seal No. 115 (Marshall)

Seal No. 40 (Marshall)



Seal No. 524 (Marshall)

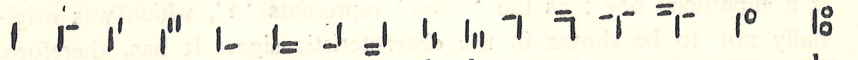
(5) Scholars including Sir John Marshall, Rev. H. Heras, Rhozny and others, who must have had occasion to inspect the tablet, did not notice that a considerable part of the writing on it varies largely from the Indus Valley script, and therefore, they did not find special investigations necessary. Fortunately while passing over it, I was struck with the find which made me to pause for a while, when I noticed and recognised the writing. The writing is partly in the Indus Valley script and mainly in Brahmi, fully developed in its technique and easy in its strokes. Surely I was looking at the very Brahmi writing of the Vedic period embodying

* Mohenjo-Daro and the Indus Civilization, Vol. II, pp. 425-426.

the *Maheshwari* technique. The text is very simple and short, befitting a tag, pertaining to the shipment of cargo from India in the third millennium B.C. The writing on the clay tablet if read from right to left, makes sense as "*MARIMALA* ". This is a bill of lading issued from some Indian port on the West Coast of India to the port and market place of Mari, a well-known Biblical flourishing city on the banks of the Euphrates in Syria. The emporium of Mari was an ancient capital of Syria, and a famous market-place, trading with the ports on the eastern coast of the Mediterranean and those of Palestine, Syria and Egypt of the Fertile Crescent.

(6) The first letter is '*Ma*' with the original labial classic crescent stroke without the inherent *mātrā-laxion* of 'a', or alif absent, as was the practice laid down later and supported by the great grammarian Panini in his *Astadhyayi*. The letter '*Ma*' is in the perfect stroke of the class consonant '*P*' with the additional circle of the nasal sign. There is no calligraphic change in this letter. The same is found in Asokan Brahmi even after two thousand years, without any change.

(7) The second letter is '*Ṛ*' or '*Ri*', a formation of vertical line 'alif' with the *mātrā-laxion* of the vowel *Ṛ*. This is a special system of formation of vowel-signs, following the consonants and merging with them to form syllabic letters. It must be noted that the writing of this tablet is from right to left. The *mātrā-laxions* added to the vertical line of 'alif' also follow a system of phonetic notation. In Nagari or Devanagari, this 'alif' formation of the merging vowels has been changed from left to right.



a ā i ee u oo ṛ ṝ ḷ ḹ e ai o au am aha.

Vowel formation from left to right.

aha am au o ai e ḹ ḷ ṝ ṛ oo u ee i ā a

Vowel formation from right to left.

(8) In Brahmi the letter '*R*' is generally written by the vertical line and the *mātrā-laxions* are added to, as found in the Babylonian tablet, *Ra* * In Nagari or Maharashtra *Modi* '*Ra*' = ɪ, which is also always seen in Nagari conjunct consonants such as श्र प्र प्र क्र भ्र etc.

* Please refer to the decipherment of a Pre-Asokan Brahmi Writing by the author, *Journal of the Bombay Branch of the Royal Asiatic Society*, Vol. 29, Pt. I, 1954, page 62.

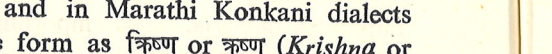
(9) '*R*' of the Nagari writing is generally found in all the North Indian scripts written with the vertical line and the *mātrā-laxions*. '*Ri*' of this inscription shows an ancient system of vowel formations, i.e. a vertical line receiving *mātrā-lexions*. Phonetically '*R*' (ऋ) is changed to '*Ri*' or '*Ru*' in all Prakrit languages derived from Sanskrit. In Marathi of the 12th century A.D. and in Marathi Konkani dialects the word 'कृष्ण' (*Kṛiṣṇa*) takes the form as क्रिष्ण or क्रुष्ण (*Kṛishṇa* or *Kṛuṣṇa*). The second letter '*R*' may be pronounced as '*Ri*' or '*Ru*', and the word of the first and second letters can be deciphered as *MARI* or *MARU*; of these I select the former '*MARI*'.

(10) The third letter is '*Ma*'. It exhibits a calligraphic change in outline of '*M*' very much on the lines of the ideograms of the Indus Valley script. It must be presumed that the scribe knew both the scripts, and of course while writing hurriedly he produced such a sign with the *mātrā-laxion* of '*a*' and the flattened cipher and crescent of '*M*' in a continuous line. An important point of notation of *mātrā laxion* seen in this outline of '*Ma*' is that they are attached to the letters directly, without the medium of the 'Alif', as found in Nagari and allied scripts. This system has been followed in all South Indian and Further-Indian scripts, which shows a traditional Vedic system of writing. Phonetically the *mātrā-laxions* of vowels, following and merging with consonants in syllabic writing, must be attached directly to the symbols of consonants. The medial 'Alif' or '*Kānā*' of the Nagari Devanagari is a superficial one; as the '*Kānā*' represents '*a*', which was originally not to be shown in the characteristic sign. It has, therefore, been dictated by our grammarians that a consonant must be shown with an apostrophic sign on top or at the bottom. In Tamil this apostrophic dot is found on the top while in Devanagari it is at the bottom of the character. It is a false notation to show the inherent '*a*' by a *Kānā* and then to show the non-existence of the same in that letter by an apostrophic mark. This letter therefore definitely proves that Brahmi syllabary has been in use in the third millennium B.C. or even before that; but was written from right to left. The letters of the Eran coin boldly support this fact.*

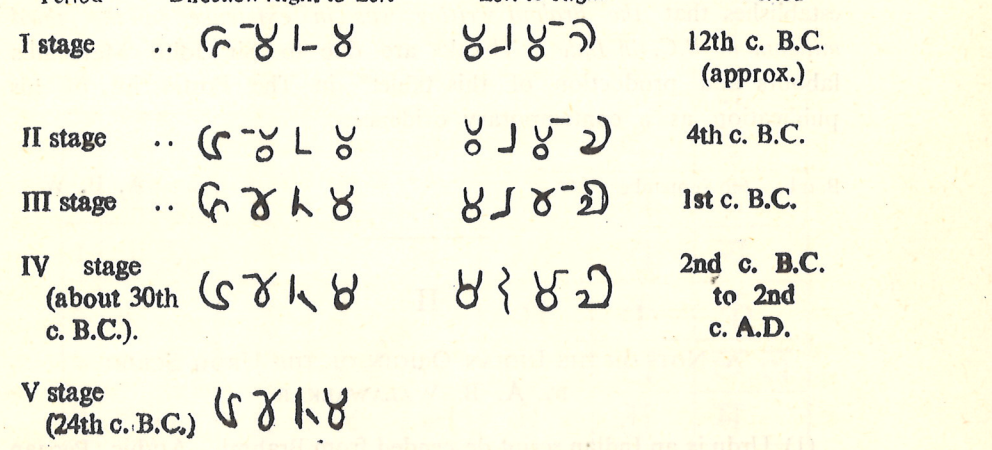
(11) The fourth letter is '*La*' which is an extraordinary character showing an antique development of the original Brahmi '*La*' by

*See Dr. D. Diringer, *The Alphabet*, p. 332.

centuries. The Asokan Brahmi '*La*' is an exact mirror image of this. The '*La*' and '*Ha*' of Brahmi writing of the post-Vedic Brahmi are the '*Ha*' and '*La*' of the Asokan Brahmi respectively, as illustrated below:



In Phoenician-Greak, written from *R* to *L*, these peculiarities are found, *viz.*, 𐤋𐤊𐤉 = *ELK* where the letters are laterally inverted. It is interesting to see how the letter '*La*' and '*Ma*' of this inscription are developed from the original writing.



The existence of Brahmi of a mixed but stylised calligraphy and of variants in the same character of a palaeographic nature of 24th century B.C. pre-supposes traditional writing of a long past.

(12) The fifth is a numeral ideogram of six vertical dashes, two on the top and four at the bottom. It may mean 20+4, 20×4+2 or 20×2+4, 400+20 or 200+4, cases or bales of cargoes, shipped to the port and market-place of Mari in Syria.

(13) The sixth letter is a trident, a sacred sign of navigation, a Sumerian ideogram at the end of the sentence meaning picture of *Bel*-tree; and may be taken as bales. This trident ideogram was used by the people of the Furtile Crescent, India, as well as in the Indus Valley seals and the tablets found at Ur and Mohenjo-Daro.

(14) I assume that this tablet is a bill of lading for a shipment of fabrics from India. The screen of vertical and horizontal lines inscribed on the back of the seal probably indicates a definite commercial trade mark of cotton fabrics. The inscription may be deciphered as ' Mari Mala 204 bales ', i.e. " Two hundred and four bales of cargoes bound for Mari ".

(15) This Djokha tablet is a precious epigraphic evidence of Brahmi writing of the third millennium B.C. confirms the ancient trade communication of the East with the Furtile Crescent and Biblical references thereto. This inscription of the Vedic Brahmi and the Brahmi letters found on some of the Indus Valley tablets further establishes that *the Brahmi writing was in existence in the third millennium B.C. in India.* Thanks are due to Sir John Marshall's labours and production of this tablet* in The Post-script of his publication as a contemporary evidence.

Bombay, 6th September 1962. A. B. W.

II

A Note on the Indian Origin of the Urdu Script

BY A. B. WALAWALKAR

(1) Urdu is an Indian script descended from Brahmi. Arabic, Persian and Urdu are generally considered as Aramaic scripts of the semitic family. But in my observations I found certain similarities in the outlines of characters, their variants, dots, *mātrā* signs called *nuktās* and their original consonantal writing exactly similar to the Pre-Asokan Brahmi. Since 1949 when I came in contact with Dr. S. Mahadi Hassan, now Deputy Director of Industries, Pakistan, and Shri L. S. Wakankar, savants of the Arabic, Persian and Urdu calligraphy and the investigators of its origin, I learnt a lot and was happy to arrive at a definite conclusion, that the Arabic or Persian or Urdu scripts are the original writings of Brahmi written from right to left.

*The two views of this seal are reproduced on page 41, from sketches brought by L. S. Wakankar, in 1962, from the Musee de Louvre, Paris.

Table 89. **Chart of different South Asian and Mediterranean Scripts showing lack of resemblance of Nabatean with other scripts, but remarkable resemblance with Girnar Brahmi (Reprinted from 'Indian Origin of Arabic Script' by L. S. Wakankar, '*United Asia*', Bombay).**

ROMAN रोमन	GREEK ग्रीक	PRON. उच्चार	हिब्रू HEBREW MODERN	HEBREW OLD C.1000 B.C.	उच्चार PRON.	ANCIENT-ARABIC प्राक्-अरब LIHYANTAN 525 B.C.	SABAEAN 200 B.C.	THAMUDENE 500 B.C.	PRON.	LATER-ARABIC उत्तर-अरब MODERN	KUFIC	NABATEAN	URDU उर्दू URDU PRON	KHAROSHTHI खरोष्ठी (अरबसूची)	गिरनार-अन्य GIRNAR & OTHERS गिरनार-अन्य 300 B.C.	BRAHMI ब्राह्मी BHATTIPROLU भट्टीप्रोलू 250 B.C.	KUSHAN कुषान 100 A.D.	GUPTA गुप्त 375 A.D.	DEVANAGARI देवनागरी MERUVARMA मेरुवर्मा 800 A.D.	DHARA धारा (भोज) 1000 A.D.	CURRENT वर्तमान 1900 A.D.
A	A	ALPHA आल्फा			ALEPH अलेफ्				ALIF अलिफ				ALIF अलिफ								
B	B	BETA बीटा			BETH बेथ्				BA बा				BE बे								
G	Γ	GAMMA गामा			GIMMEL गिमेल्				GAIN घैन				GAIN गैन								
D	Δ	DELTA डेल्टा			DALETH दालेथ्			d	DAL दाल				DAL दाल		(ध)						
E	E	EBSILON एप्सिलॉन			HE हे				HA हा				HE हे								
V		WAW वाव			WAW वाव				WAW वाव				WAW वाव								
Z	Z	ZETA झीटा			ZAYIN जाइन्				ZA झा				ZE झे								
H	H	ETA ईटा			HETH हेथ्				HA हा				HE हे								
T	Θ	THETA थीटा			TETH तेथ्				TA ता				TOY तोय								
I	I	IOTA आयोटा			YODH योध्				YA या				YE ये								
K	K	KAPH काफ			KAPH काफ़्				KAF काफ				KAF काफ								
L	Λ	LAMDA लामडा			LAMEDH लामेध्				LAM लाम				LAM लाम								
M	M	MU म्यू			MEM मेम्				MIM मीम				MEEM मीम								
N	N	NU न्यू			NUN नून्				NUN नून				NUN नून								
O	O	OMICRON ओमिक्रोन			AYIN आइन्				AIN आइन				AIN ऐन		[ओ]						
P	Π	PAI पाय			PE पे				FA फा				FE फे								
R	P	RHO हौ			RESH रेष्				RA रा				RE रे								
S	Σ	SIGMA सिग्मा			SHIN षीन				SHIN षीन				SHIN षीन		नागार्जुन गुंफा						
	T	TAW टाव			TAW थौ				THA था				THE थे, टे								
	Ξ	XI सी			SAMEKH सामेख्				SIN सीन				SIN सीन		नाणा घाट						
		Wakankar 1949. BOMBAY-INDIA.			SADE शाधि				SAD शाद				SWAD स्वाद		[स्व]						
					QOPH खोफ				KHAF काफ				KHAF काफ		BHARHUT भरहूत						

Facing page 632

Dr. S. Mahadi Hassan and Shri Wakankar are the pioneers of this discovery and I fully agree with them that the Arabic Alphabet does possess the basic strokes of the Devanagari and the mother script Brahmi.

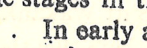
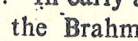
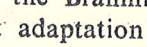
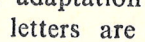
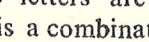
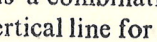
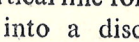
(2) Shri L. S. Wakankar has shown that the modern Arabic script is a direct adoption of Brahmi. I reproduce a chart prepared by him in order to explain his theory. Both Dr. S. Mahadi Hassan and Shri Wakankar agree that Arabic script has an Indian origin and it can be traced in Nagari or Brahmi. Shri Wakankar shows in his chart by tabulating Aramaic, Hebrew, Nabatean and Kharoshthi that only Arabic and Urdu scripts do possess elements from the Indian Alphabet. I, however, see a concealed lineal flow of a system of strokes of the Brahmi Alphabet written from right to left. The Arabs who were in constant touch with the Indian culture, developed this script under the impact of Indo-Iranian culture, when Persians established their political superiority by supporting Abbasid Khilafat.* The Persians collected the "*Suras*" of Kuran wrote them in the revised script which became common to Arabs as well as the Persians. Umayya also had to adhere to this revised script introduced by the Abbasids. We see two fashions of Arabic script, i.e. Kufic and Naskhi, The system of Hebrew writing was also revised after the Khalif's Koranian writing. The Arabic, Persian, Sindhi and Urdu are sister scripts. Urdu is therefore an Indian script worth encouraging for a fast writing in India. I propose to deal with this subject in may revised edition of pre-Asokan Brahmi and show that Urdu script is an Indian script written from right to left and not a semetic one.

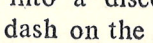
(3) The following are very brief notes on this subject :

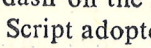
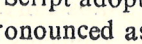
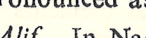
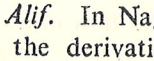
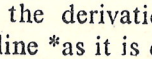
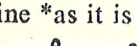
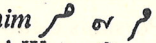
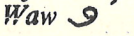
1. Alif "ا", Kaf "ک", Gaf "گ", "ع" Ain, "غ", Gain.

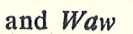
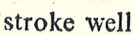
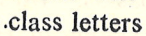
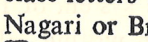
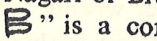
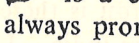
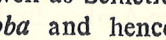
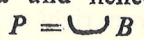
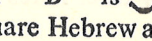
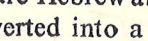
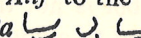
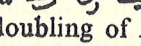
Alif of the Arabic alphabet is not the letter "*A*" but a diacretical mark or a vertical line added to a consonantal letter, in order to form an '*Akshar*' i.e. a letter having an inherent "A" to be pronounced along with the consonant. The original vowel letter "*A*" of the Indian Alphabet Brahmi contains two crescents placed like this 𑀅 . This they used to write without lifting the pen "𑀅" or "𑀅". It is a vowel of the guttural class and has a phonetic value of "K" pronounced softly as Ain. The Phoenician Traders adopted this Indian 𐤀

* *See* 'Persian Element in Islam' by M. L. Roy Choudhary Shastri, *United Asia*, Vol. III, No. 4.

for a semetic letter "*A*". The stages in the formation of this א are  or  . In early and also in modern Hebrew, the two elementary crescents of the Brahmi technic are clearly seen. This Hebrew א is a direct adaptation of the Brahmi Alphabet. The variations of these two letters are  = *K* and  *A*. The '*K*' of the Semetic alphabet is a combination of *Alif* and *Kaf* i.e. the angle stroke for *Kaf* and the vertical line for *Alif*. The formation of the "*K*" was originally divided into a disconnected sign  and  . Further with an addition of a dash on the *Kaf*, it was converted into *Gaf*  . Therefore, the Arabic Script adopted the vertical line for *Alif* and *Ain* for "*A*", but softly pronounced as "*K*".

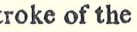
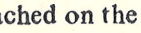
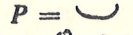
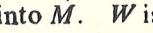
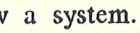
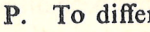
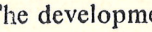
It may be taken as *Alif* or *Alif*. In Nagari script and other north Indian Alphabets which are the derivations of the Brahmi, *Alif* has been maintained as a vertical line *as it is e.g. Nagari  etc.

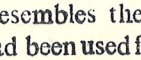
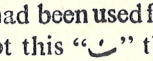
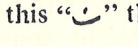
(2) *Be*  , *Fe*  , *mim*  or  , *Se*  (*PSH*), *Pa*  , *Ta*  (*PT*) and *Waw*  .

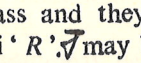
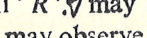
In the Semetic languages there is no difference in *Ba* and *Pa* just like Tamil. *Ba*, *Pa*, *Fa*, *She*, *Mim* and *Waw* are of the Labial class and have a common basic crescent stroke well balanced " ◡ ". This stroke has been developed into class letters by the addition of top and bottom dots. From *Pa* of the Nagari or Brahmi or of the Greek and Latin we get *Ba*. The Greek "Β" is a conversion of "*P*" similar to Brahmi or Nagari. '*B*' is always pronounced as '*W*' in all the Indo European languages as well as Semetic languages, e.g. *Wadi* and *Badi* or *Cardova* and *Cardoba* and hence the outline of *B* and *W* are similar in the beginning, *P* =  *B* =  *W* =  or  and therefore, the formation of "*B*" is  or  is seen in Semetic, Arabic, square Hebrew and Rabbinic.† The double crescent of '*B*' was later converted into a dot by the scribe for his convenience in order to apply *Alif* to the basic stroke and not to the additional stroke e.g. to write *Ba*  i.e.  are the obvious stages. *Fa* is also a doubling of *Pa* but in a different way, which is similar to Wa and to distinguish it from '*Wa*' the scribe put, a dot on top of '*Waw*' i.e.  *Fa*, while  is a '*Waw*'. It is a general practice of applying *Alif* to the upper crescent and not the lower one which has been taken as a mark of phonotic conversion. *Fa*  (Nagari  is a Brahmi '*F*', adopted with the original outline

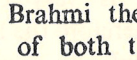
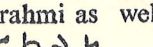
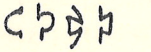
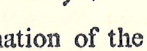
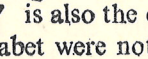
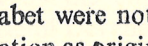
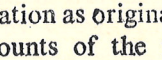
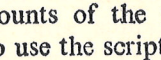
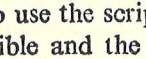
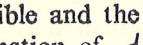
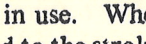
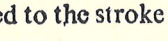
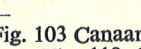
Vide of Dr. D. Diringer. *The Alphabet* Fig. 110 and 132

†*See* Fig. *Ibid* 128 and 132

of '**P**' and with the additional stroke of the Aspirate. The letter '**M**'  is also a direct formation or conversion of '*P*' or '*B*' into nasal with an additional nasal sign attached on the top where '*P*' or '*B*' has been converted into '*M*'. *P* = *B* =  *M* =  but later on these forms or  of *M* came in use. "*M*" is therefore, the formation of *P* into *M*. *W* is a doubling of *P* and it is a labial semi-vowel and always confounded with *B*. The doubling of is *B*  or *W*, *P*, and *B* show a system. The Semitic W "  " has got also elementary strokes of P. To differentiate '*B*' from *W* they wrote  for *B* and for *W*. The development of *W* and the same of *B* clearly defines the transitions.

(3) *Nun* "  " of the Arabic resembles the '*N*' of the Brahmi. In early Arabic and Kufic *N* "  " had been used for *N* directly. Afterwards they found it more easy to adopt this "  " than "" (*N*).

(4) *Dal*  and *Ra*  .

D and *R* are of the same class and they had their original form somewhat similar. The Bengali '*R*'  may be taken for comparison.* In all these representations one may observe that the *Dal* and *Ra* had one and the same outline. In Brahmi there are two *Da* and *Da* i.e. ड or द. The basic crescents of both these lingual and dental are  and  . We find them in Brahmi as well as in South Semetic and Sabaean script adopted as  and further (Rabbinic)† *Dal* is a definite adoption of Brahmi. The elemination of the top stroke of *Dal*  created the dot on the top of  . This resembles Nagari  or  and  shows the origin. *Ra*  is also the original *Dal*. The Semitic while adopting the Indian Alphabet were not very particular about the minute shreads of the pronounciation as originally the Semetic script was required to keep books of accounts of the merchants and traders in order. But when they wanted to use the script for notations for higher culture and literature like the Bible and the Koran they became very particular in writing. The formation of  and  are practically the same. The lower portion of  i.e. dotted stroke as shown here being dropped ; and "" thus came in use. Whenever the *Alif is* added to '*R*' and '*D*' it is never attached to the stroke but kept aloof to indicate

*See Dr. D. Diringer, *The Alphabet* Fig. 103 Canaanite. 114 Phoenician. North Semetic Fig. 109 Sabaean Fig. 110. Early Hebrew Fig. 118, 128, 132 and 136.

† Maghribi *see* fig. 132 col. 7.

that there is something dropped of the stroke and therefore the Ra and *Da* are written as ر ز. It should be remembered that whenever the vertical line of the Alif is found detached from the consonantal stroke, the consonantal letter lacks some stroke which has been dropped in the resilient writing. *D* and *R* therefore are thus the adoptations of the Indian Alphabet.

5. *Qaff* ق = *Q*

The formation of *Fa* ف has been discussed above. ف is a conversion of ڧ and has got no other derivation. The Cannanite "𐤒" and the Aramaic "𐡒" are the direct borrowings of the Indian Alphabet 𑖓 The guttural of *K* and *Kh* are also obvious in the Rabbinic (Rashi writing).

The formation is very clear

But this letter presented difficulty to adopt for *Naskhi* writing and therefore the scribe preferred to conversion of ڧ to ق and there is no other solution for this form.

6. *Ye* ي

This letter is also adopted from the Indian Alphabet ي ے. The development of this *Y* is very clear. The lineal sign ى = *Y* resembles "ى" dal and therefore the lower dots of *Y* came in practice, to differentiate from the *Dal*.

Bombay, December 20, 1960. A. B. W.

APPENDIX E

DEVANAGARI ON THE TYPEWRITER*

Although the idea of typing characters mechanically was patented on July 7, 1714 by Henry Mill, the first workable gadget was made only in 1833 by Xavier Progin, a Frenchman. In 1866, C. Latham Sholes and W. Soule perfected a device for printing numbers on Bank-notes. These two, together with Glidden, were inspired by a paper in *Scientific American*, on a typewriter perfected by John Pratt. They started work on the invention of a workable device and actually produced a typewriting machine in September 1867.

Latham Sholes, in collaboration with James Densmore, later prepared some 25 different models and presented a good prototype to the Remington Small Arms Factory in 1872. In 1873 the first typewriter was produced in U. S. A. A machine with visible types was put on the market in 1896. The first "Portable" was marketed in 1910, followed by a "Noiseless" in 1914. The American production was closely followed by production of Typewriters in Germany, Italy, Sweden, France and England. The first electric typewriter was put on the market in 1930.

Remington and other manufacturers soon started supplying typewriters with Indian Scripts. Paillard (Switzerland), in collaboration with the house of Tatas, did original work on Hindi Typewriters. They prepared four different models for the Kalelkar Committee. None of these efforts were supported by the official agencies and thus the labour was wasted. The most useful Devanagari typewriter was made in Germany, which was designed by V. M. Atre, under the name *Nagari Lekhan Yantra*. It worked on three shifts, four bank system. The German firm, Bureau Machinanfabrik "Olympia", made the Mishra-Hindi Typewriter, on two shifts, four bank system, using the half-space movement, for certain narrow-set letters.

ATTEMPTS TO STANDARDISE THE HINDI KEYBOARD

By 1950, more than 18 different Devanagari Keyboards were on the market. Dr. Rajendra Prasad, early in 1948, wrote to Pandit Jawaharlal

* Adapted from the articles "Devanagari-Characteristics and Mechanisation," by L. S. Wakankar. *Bulletin of Federation of Master Printers*, October1962, December 1962, February 1963 and October 1963.

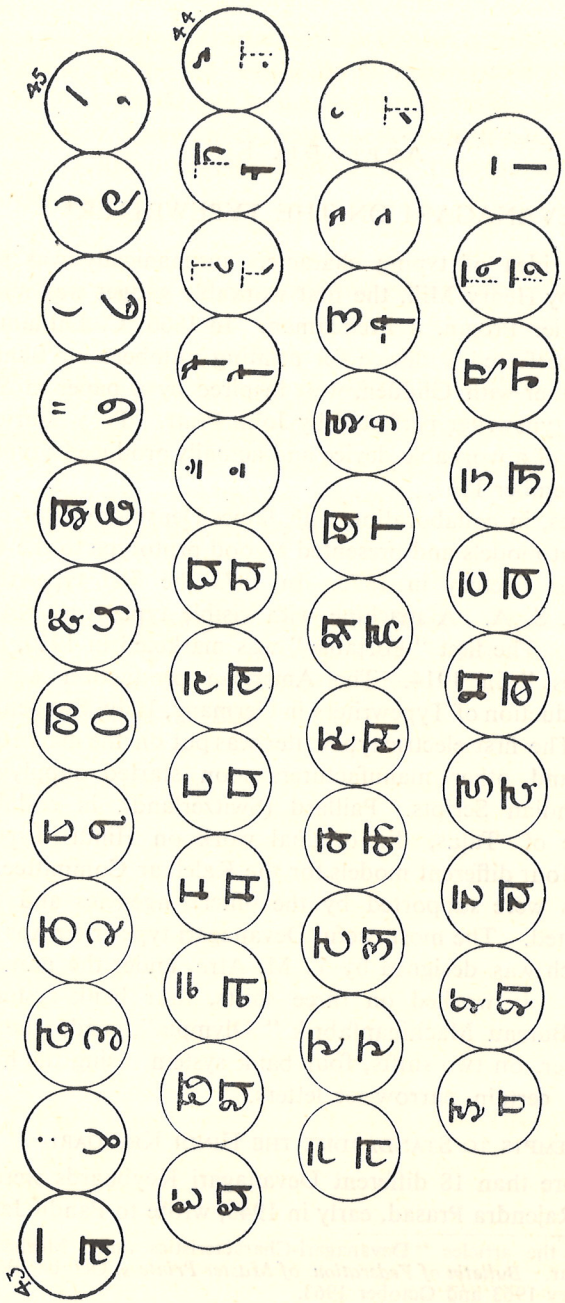


Fig. 218. **Revised Keyboard supplied by the Finalising Committee**
(Appendix C, D, Report of the Standardization Committee, page 138)

Neharu on the need of a Standard Devanagari Keyboard for administrative purposes. Pandit Nehru wrote back, (11th April) " I think that you might appoint a Committee on behalf of the Constituent Assembly of India ", and as a result a Committee, consisting of the following members, was appointed by the Constituent Assembly :

(1) Shri Kakasaheb Kalelkar, Hindustani Prachar Sabha, Wardha, (Chairman).
(2) Shri M. Sathyanarayana, Dakshina-Bharat Hindustani Prachar Sabha, Madras.
(3) Prof. Kripanath Mishra, Science College, Patna.
(4) Shri Shrimannarayan Agrawal, Wardha.
(5) Dr. Babu Ram Saksena, Allahabad,
(6) Bhadant Ananda Kausalyayan, Wardha.

Preliminary report submitted by this Committee was published on February 8, 1951. The Ministry of Education, Government of India then appointed an Expert-Committee to design the Hindi Typewriter and Teleprinter keyboards. The Committee consisted of :

(1) Shri S. M. Agarwal, Director-Telephones, Post and Telegraph Department.
(2) Shri A. C. Sen, Controller of Printing, Printing and Stationery Department, Government of India and
(3) Dr. Yadu Vanshi, Central Hindi Directorate.

The Experts Committee brought out its first report in May 1952. The report advocated the provision of half-movement keys and introduced the principle of arranging the keys according to the propitiousness of the characters and the frequency of their occurance. The typewriter manufacturers, however, pointed out that in this keyboard the dead-offset keys were dispersed and their inclusion in a typewriter segment was not mechanically possible. An improved design of the standard Keyboard was finalised in 1962, by grouping the dead-offset keys on the left-hand side. This keyboard was however critisised in informed circles, as the half-forms of letters ह, ह्र, ह्म, ह्य, ह्व, ह्ल, ह्न, ह्ग, ह्ड, and ह्र, were not provided, which necessitated using *halanta* even in case of these vertibar letters in conjuncts. Many words could not be typed accurately on such a machine. This design was thus not in confirmity with the official resolution on Standardisation of the Devanagari Script, adopted by the Education Ministry.

Ad-Hoc Committee of the Maharashtra Government

In view of the shortcomings of the above 1962-Keyboard, the Government of Maharashtra felt that the problem required further study.
(continued on page 643).

(*Vide* Communication to States by the Ministry of Education, New Delhi, No. F. 4-7/57/H-12/of21st January 1960).

HINDI TYPEWRITER

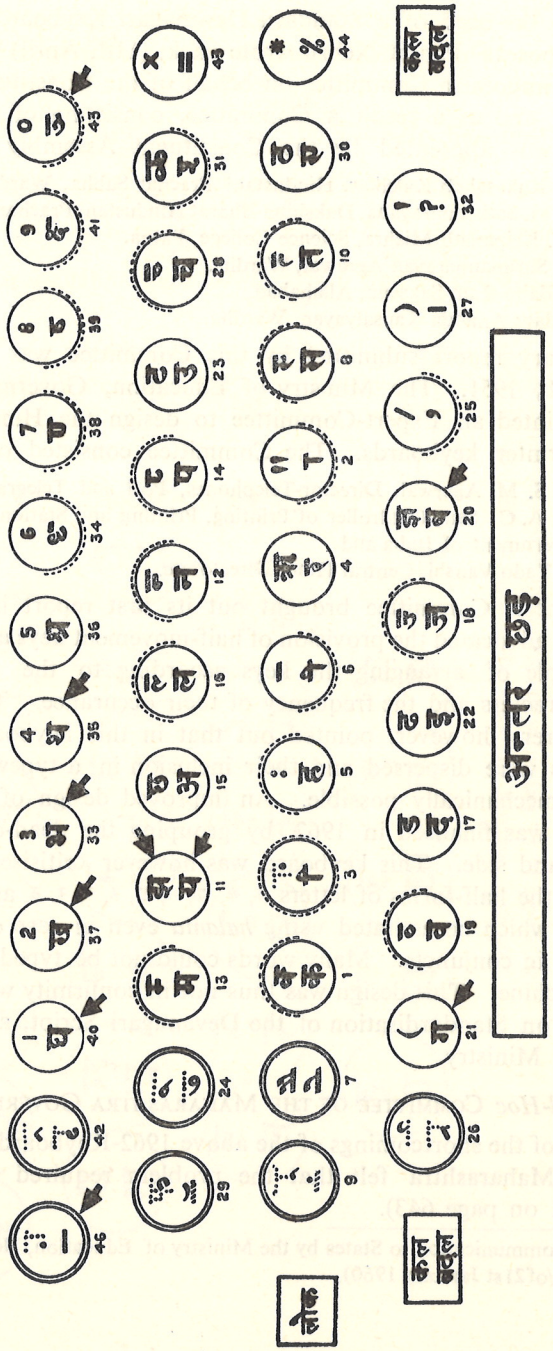


Fig. 219. **Final Keyboard layout for Hindi 1962**
(Shortcomings are indicated in the chart by arrows)

Legend :

1. Number below the keys indicate their relative order of propitiousness.
2. Dead and offset keys.
3. Keys having half movement in upper shift.
4. Keys having half movemeat in lower shift.
5. Keys having half movement in both shifts.

Notes :

1. Dot in upper shift of key No. 3 is the multipurpose dot for making—ङ from ड, ; from , and to be used as a decimal sign.
2. In upper shift of key No. 6 is the hyphen.
3. In the upper shift of key No. 9 is the *halant* sign.
4. In upper shift of key No. 29 is the special sign for making फ from प, ऊ from उ and ऋ from र.
5. *Mātrā* for long आ in lower shift of key No. 2 is to be used also for making full consonants from half consonants ह्, ह्, ण्, ध्, क्ष् and ञ in keys.
6. In lower shift of key No. 46 is the under lining dash.
7. In upper shift of No. 46 is the bottom dot for making ड़ from ड, ढ़ from ढ etc.
8. Sign in lower shift of key No. 26 is the form of र to be used with प etc. as in प्रेम.
9. Sign in upper shift of key No. 42 is the form of र to be used with ट etc. as in ट्रक.

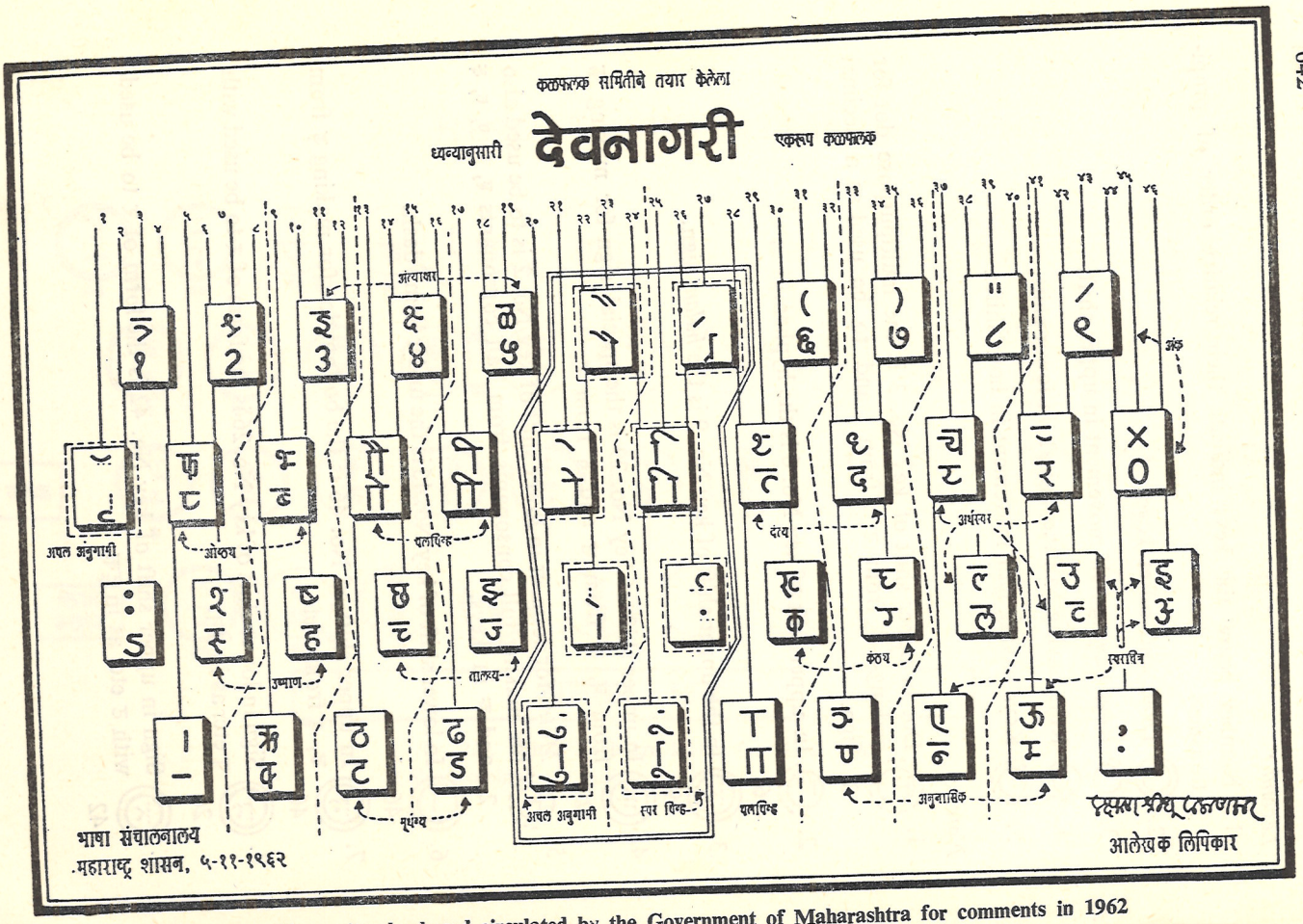


Fig. 220. **Typewriter keyboard circulated by the Government of Maharashtra for comments in 1962**

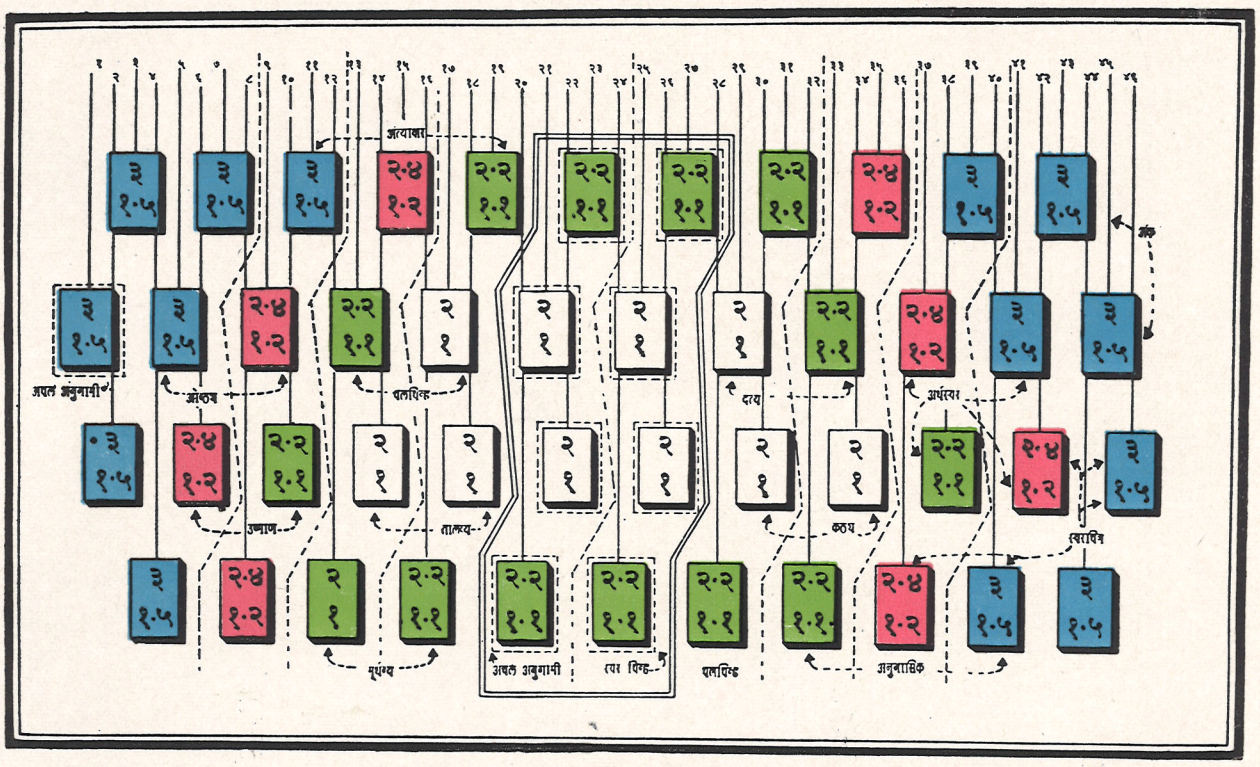


Chart showing (i) Most propitious (White); (ii) Propitious (Green); (iii) Less propitious (Red); and (iv) Least propitious keys (Blue). The lower figures show effort value for normal position and upper for shift position.

An *Ad-hoc* Committee with the following members was appointed by the Government of Maharashtra :

Chairman

(1) Dr. W. N. Pandit, M.A., PH.D., Director of Languages, Government of Maharashtra.

Members

(2) Shri B. S. Naik, B.A. (HONS.), M.I.PTG.M., F.R.S.A. (LON.). Deputy Director Government Printing and Stationery, Government of Maharashtara.
(3) Shri S. A. Sapre, B.A. (HONS.), B.SC. (HONS), Principal, Government Institute of Printing Technology.
(4) Dr. S. V. Bhagwat, M.A. PH.D., Registrar, Nagpur University.
(5) Shri L. S. Wakankar, B.SC. (TECH)., Proprietor, Kromo Prints Corporation (India).

Secretary

(6) Shri N. K. Upasani, M.A., M.ED. (ARIZONA, U.S.A.) Deputy Director of Languages Government of Maharashtra.

Shri G. P. Vijapure, ex-Manager of the Kirloskar Press, was later nominated on the Committee.

The Committee set before itself the following guiding principles, in evaluating various suggestions on the standard keyboards :

(*a*) *Orthographic Test :*—To examine conformity with the Standard Script approved under Government Resolution, E. & S. W. D. No. TBK/1762-G of 20th July 1962 which was based on the Government of India, Ministry of Education, Communication No. F. 4-7/57-H/2 of 21st January 1960.

(*b*) Ninety-two *Graphemes* were selected as essential and they were arranged in order of their ' graphemic ' frequency evolved from the studies conducted by Dr. S. V. Bhagvat at the Deccan College Post-graduate Research Institute, Poona. System of lateral conjugation was prepared (क्क, क्व, छ्व, द्य, न्न, ह्न, etc.) to replace the manuscript system of vertical conjugation of consonants. (क्क क्क, छ्व, द्य, न्न, ह्न, etc.)

(*c*) *Effort-saving signs*, such as ा, ी, ि, े, ै, ृ, ॄ, etc., were considered added convinience.

(*d*) *Conversion-potential :* The Standard Keyboards should be such that it should be possible to convert the existing English Machine to the Hindi Keyboard.

(*e*) *Relative merits* of different keyboards were to be judged by assigning effort values to the finger-movement regions, obtained from the propitiousness charts, prepared by the Agarwal Committee of the Government of India.

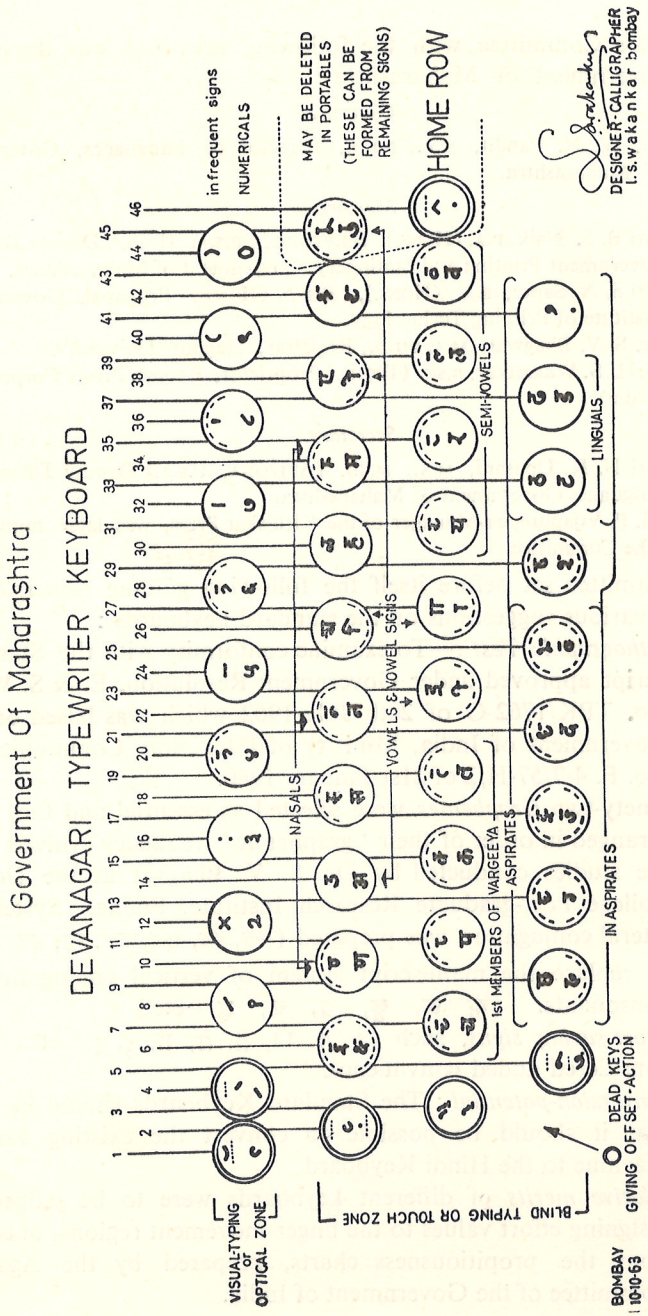


Fig. 221. **Devanagari Typewriter Keyboard (Provisional) (1963)**

Following formula suggested by S. A. Sapre was accepted for relative evaluation of different Keyboards :

Total Effect Value ' E ' = fx,

where f = frequency of use, x = positional value.

Effort value total will be inverse of relative efficiency.

Effort-Value Determination

Increasing effort values were assigned to the keys placed away from the ' home row positions '. Positions in shift were given double the value assigned to unshift positions as extra effort has to be put in for :

(*i*) Pressing of shift-keys, (*ii*) Striking the character-key, (*iii*) Release of movement of finger to next typing key.

Table (Appendix 4 and 5).

Region movement	*Colour allotted*	*Row*	*Operating finger*	*Effort-values*	
				Un-shift	*Shift*
Most Propitious ..	White ..	Home ..	1st-2nd ..	1·0	2·0
		Upper ..	1st only		
Next Propitious ..	Green ..	Top ..	1st	1·1	2·2
		Upper	2nd		
		Home	1st		
		Bottom.	2nd		
Less Propitious ..	Red ..	Top ..	2nd ..	1·2	2·4
		Upper	3rd		
		Home	4th		
		Bottom	3rd		
Least Propitious ..	Blue ..	Top ..	3rd ..	1·5	3·0
		Upper	3rd		
		Home	4th		
		Bottom	4th		

Frequency of Numbers

Frequency counts of characters in 1,00,000 words were reproduced. They were based on the study conducted by Dr. Bhagwat at the Deccan College Post-graduate Research Institute, Poona.

Maharashtra Committee's Criteria

The proposed Keyboards were compared by the Committee by applying the following criteria :

(1) *Preliminary Test.*—The keyboards which did not provide for all the essential characters were rejected.

(2) *Orthographic Test.*—(*a*) Provision for constructing complete vowelisation series (*Bārākhadi*) of all characters, consonants and conjuncts. (continued on page 651).

देवनागरी कळफलक

KEYBOARD FOR THE STANDARD (46 Key) & PORTABLE (44 Keys)

DEVANAGARI TYPEWRITER

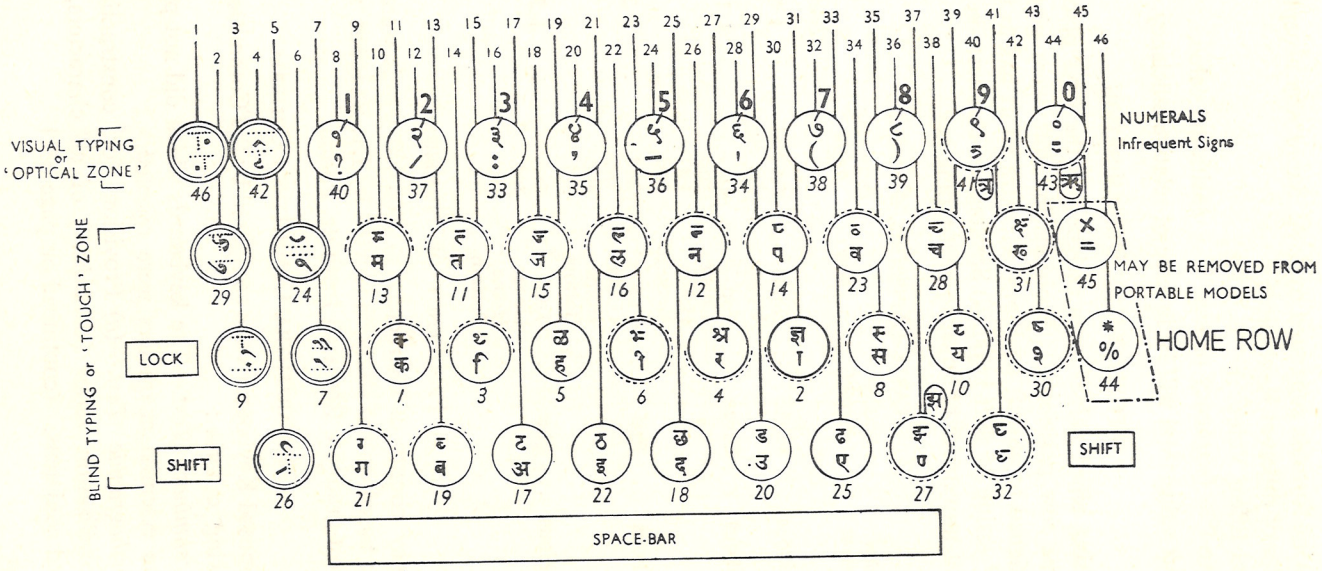


Fig. 222. **Devanagari Typewriter Keyboard (Interium) 1965**

49
1. 5 Numbers above the keys indicate their Sequence Number. Number below the keys indicate their relative order of propitiousness.

2. Dead and Offset keys.

1
1. 46 Dot in upper shift of key No. 1 is the Multi-purpose Dot for making (a) ङ from ड, (b) ; from , and (c) to be used as Decimal sign.

2. 46 Dot in lower shift of key No. 1 is the Bottom Dot for (a) making ड़ from ड, (b) ढ़ from ढ, etc. [See also note 12].

5
3. 26 Sign in lower shift of key No. 5 is the form of ॅ to be used with प, etc. as in प्रेम.

4
4. 42 Sign in upper shift of key No. 4 is the form of ॅ to be used with ट, etc., as in टूक.

3
5 9 Sign in lower shift of key No. 3 is the ANUSWAR.

3
6 9 Sign in upper shift of key No. 3 is the HALANT sign.

2
7 29 Sign in upper shift of key No. 2 is the special sign for (a) making फ़ from प, (b) ऊ from उ and (c) रू from र, रू will be typed as रू.

24
8. 36 Sign in lower shift of key No. 24 is the HYPHEN; Using the varilinar, this will also be used as the UNDERLINING dash.

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DIRECTOR OF LANGUAGES.
GOVT OF MAHARASHTRA

LEGEND

3. Keys having half-movement in UPPER SHIFT.
4. Keys having half-movement in LOWER SHIFT.
5. Keys having half-movement in BOTH SHIFTS.

NOTES

31
9. 2 Matra for long आ in lower shift of key No.31 is to be used also for making full consonants from half consonants: ङ, ण, ढ़, ध़, भ़, ऱ, ऴ, ल़, व़, क़, ज़, ऩ, in key Nos. 41, 37, 15, 41, 23, 43, 43, 42, 42, 37 and 40.

8
10. 1 The International form of Numeral 1 in upper shift of key No. 8 will also be used as VIRAM sign, in case of Hindi Version.

28
11. , Sign in the lower shift of key No. 28 is the INVERTED COMMA.

12. The following signs will differ in Hindi Keyboard from Marathi Keyboards:

key No.	shift	Marathi Keyboards	Hindi Keyboard
40	lower	ञ (for ज्ञानेश्वर, मंत्री, etc.)	ञ
37	upper	ह्न (for ब्राह्मण, तुह्मा, etc.)	ह्न
44	lower	ॅ (for बन्हाड, कन्हाड, न्यायाल, आचार्याच्या, etc.) (will form from ९ २ ५)	ॅ
1	lower	Full Point (.), after striking the space-bar once.	.
8	upper		Viram

13. In case of Hindi Version International forms of Indian Numerals will be used.
14. For Portable Typewriters, key No. 45 and 46 will be dropped.

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DESIGNER-
CALLIGRAPHER

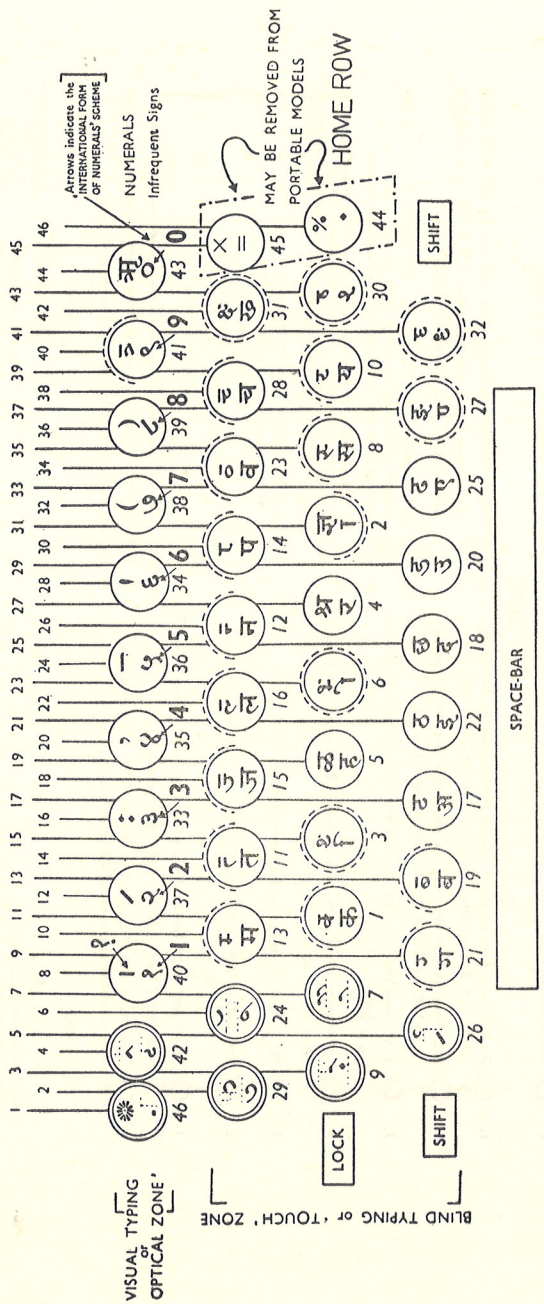

Fig. 223. Final layout of the Typewriter Keyboard for Devanagari (Final 1965) Hindi and Marathi

Legend

1. Numbers below the keys indicate their relative order of propitiousness.
2. ◎ Keys which are dead and offset, they are so in both shifts.
3. ⊙ Keys having half movement in upper shift.
4. ⊙ Keys having half movement in lower shift.
5. ⊙ Keys having half movement in both shifts.

Notes :

1. ा *Mātrā* for long आ in lower shift of No. 2 is to be used also for making full consonants from half consonants ह् and ह located in upper shift of key Nos. 3 and 6, ण located in lower shift of key No. 27 and ण् and ट, रु and क्ष, ठ and द, located in lower and upper shifts of key Nos. 30, 31 and 32 respectively.
2. ं Sign in the lower shift of key No. 9 is the *anuswār.*
3. ् In upper shift of key No. 9 is the *halant* sign.
4. र् Sign in lower shift of key No. 26 is the form of र to be used with प etc. as in प्रेम.
5. र् Sign in upper shift of key No. 42 is the form of र to be used with ट etc. as in ट्रक.
6. फ़ In upper shift of key No. 29 is the special sign for making फ from प, ऊ from उ and ड़ from र.
7. ः Dot in lower shift of key No. 44 is the multipurpose Dot to be used as a decimal sign and for making ङ from ङ and ; (semicolon) from , and
8. ़ In lower shift of key No. 46 is the bottom dot for making ड़ from ड, ढ़ from ढ etc.
9. — In upper shift of key No. 36 is the hyphen. Using the variliner. This will also be used as the underlining dash.
10. । The numeral । in lower shift of key No. 40 will also be used as the Viram sign.
11. ' Sign in the upper shift of key No. 34 is the inverted Comma.

Numerals :

12. The keyboard standardised by the Central Government incorporates international form of Indian numerals. If any State or any other body uses any other form of numerals, the sign of Interrogation (?) located in the upper shift of key No. 40 would be replaced by the Viram sign.

In Marathi Typewriter :

13. त्र in upper shift of key No. 41 and ज्ञ in upper shift of key No. 27 will be half characters.

In Portable Typewriter Keyboard :

14. (*i*) Keys No. 45 and 46 shall be dropped.

(*ii*) Key No. 44 shall be positioned to the extreme right of the bottom row *i.e.* next to key No. 32.

(*iii*) % sign in the upper shift of key No. 44 shall be omitted and instead bottom dot ॰ of key No. 46 shall be provided (in place of % sign) on key No. 44. The key No. 44 shall thus bear the characters as shown here :

(*b*) Provision of maximum number of character-signs as given in Appendix 3.

(3) *Speed-Test.*—Effort-value totals were calculated and the keyboards arranged in order of lowest to highest efforts. On the basis of the above tests the committee tabulated the various keyboards :

Keyboards Compared	*Total Effort Value*
(1) Remington " Superwriter " Keyboard ..	9,20,000
(2) Ministry of Education-Keyboard ..	7,66,200
(3) Maharashtra Keyboard-1962 ..	8,98,200
(4) Revised Maharashtra Keyboard* ..	6,80,000

The fourth keyboard was formulated by the committee on the basis of various suggestions received. The effort requirement was reduced by the removal of graphems like ा, ी, े, ि, ि, etc., from the earlier keyboard and substituting highly frequent full-consonants. Two sets of key-heads were actually made locally, one with photo-etched copper-blocks welded on to the type-heads and the other with mildsteel heads engraved on Dekel Panto-graph Engraving Machine from brass masters. The designs were drawn by L. S. Wakankar a member of the Maharashtra Committee and types were pantographed by Desai on the heads prepared by S. K. Khandekar of Vanaz Engineers Ltd. The types were mounted at the Government Stationery Department. These types were taken to Berlin by Wakankar for test, where he studied the procedure of typewriter type-designing and type-cutting. The designing of the Halda Devanagari, Halda Gujarati and Godrej Fine line Devanagari type face, by L. S. Wakankar, is based on this experience.

Revision of Hindi Keyboard

The Ministry of Education, Government of India, was aprised of the work done by the Maharashtra Committee. After studying the same the Government of India invited the representatives of the Government of Maharashtra to New Delhi for discussion, with a view to evolve a common keyboard for Hindi and Marathi. The meeting was held at the Secretariat, New Delhi and at the Telephone Directorate, on 5th, 6th and 7th November 1963. The following members participated:

Chairman

Shri R. P. Nayak, I.C.S., Joint Secretary to the Government of India, Ministry of Education.

**Devanagari Typewriter Keyboard* Directorate of Languages, Government of Maharashtra, Bombay, 1962.

Government of India Representatives

(1) Dr. Bishwanath Prasad, Director, Central Hindi Directorate.
(2) Shri S. M. Agarwal, Director of Telephones, Post and Telegraph Department.
(3) Dr. Suresh Awasthi, Deputy Director, Central Hindi Directorate.
(4) Shri Jailalji Gaktoo, National Institute of Audio-Visual Education.

Maharashtra Government Representatives

(1) Dr. W. N. Pandit, Director of Languages, Government of Maharashtra.
(2) Shri B. S. Naik, Deputy Director, Government Printing and Stationery, Bombay.
(3) Shri L. S. Wakankar, Proprietor, Kromo Prints.
(4) Shri N. K. Upasani, Principal, S. M. T. T. College, Kolhapur.

After detailed discussions, a common keyboard was evolved with minor variations in the Hindi and Marathi keyboards. Instructions were then sent to the manufacturers for production of Proto-type Machines. In 1965 members of the Maharashtra Committee met the technicians of Remington Rand at Calcutta on January 4, 1968 and considered the changes that were thought necessary.

Designing of the Typewriter Face

Following mechanical limitations were considered, while designing the characters for the Devanagari Typewriters :

Spacing.—The spacing effected by the carriage-movement in the mechanically operated conventional typewriters is constant in English-typing machine. This has resulted in squeezing of 'W' and 'M' and wider white-spacing in case 'i' 'j' and 'l'. This does not much, affect the look of the typed matter in Roman letters as they stand apart in linear setting. Unlike this, the Devanagari letters in a word are constructed by combining the vowel-signs and joining with the head line. The consonants are therefore provided in half form i.e. without verti-bar on half movement and the vowel-marks combined with verti-bar on movement key. Such a device was invented by the manufacturers of the Arabic typing-machines.

Spacing between typed lines varies with the 'size' of type face (*see* accompanying Table and Illustration), as well as, with typists, requirement of spaces between two lines :

Typical Mechanical Specification

Model	*Size*	*Spacing*	*Motion*
Remington/Underwood ..	Pica ..	2·54 MM. ..	6·65 MM.
Remington/Underwood ..	Elite ..	2·12 MM. ..	6·6 MM.
Court-Documents model ..	Large Pica ..	2·60 MM. ..	6·6 MM.
Shipping Documents Model ..	Medium ..	3·00 MM. ..	6 6 MM.
Godrej (Devanagari Fine-line) ..	Pica ..	2·6 MM. ..	8·0 MM.

N.B.—Height of the type 4·8 mm. maximum, inclusive of the ascending and descending overchanges of accents.

Type-head Parts

Motion.—Motion is the distance by which a roller lifts up or the type-bar-basket goes down, when the shift-key is pressed. This puts a limit (4·8 mm.) on the maximum height of characters. If the height exceeds this limit the parts of the ascenders or descenders will overprint in the legitimate regions of other lines above or below.

Dead-keys.—As the type-bar recedes after striking of a type, a projection near its lever kicks the escapement lever, which releases the spring-controlled roller by one space movement. If this projection is filed off, there is no kicking during the return-movement and the roller does not move to the left. Such a key is called a 'dead' or non-movement key. In the earlier models it was necessary to type the dead-keys before a character, but the newly invented offsetted keys have 'normalised' the vowelisation procedure. These dead offset keys strike through an alternate type-guide on the left-side of the usual type-guide.

Sign on the 'dead-offset' keys are :

Medial Point	॰	for making	ङ	from	ङ
Lower Point	़	,, ,,	ख, ड़, ढ़,	,,	ख, ड, ढ,
Rastra Sign	◌्	,, ,,	ट्र, ड्र,	,,	ट, ड,
Ṛ-Kār Sign	◌ृ	,, ,,	कृ, सृ	,,	क, स,
Pra-Kār Sign	◌्र	,, ,,	प्र, म्र	,,	प, म,
Reph Sign	र्	,, ,,	र्व, र्म	,,	व, म
Mahāprān Sign	◌	,, ,,	फ, ऊ, रु	,,	प, उ, र
Short-*Ukār*	◌ु	,, ,,	कु, तु, डु	,,	क, त, ड,
Long-*Ukār*	◌ू	,, ,,	कू तू डू	,,	क त ड
Single *Mātrā*	◌े ◌ा	,, ,,	के ते टे	,,	क, त, ट
Double *Mātrā*	◌ै ◌ो ◌ौ	,, ,,	कै तै टै	,,	क त ट
Anuswāra	◌ं	,, ,,	कं ढं	,,	क ढ
Virām-Mātrā	◌्	,, ,,	कॅ मॅ	,,	क म
Halānt Sign	◌्	,, ,,	ट् ड्	,,	ट ड

Half-movement.—This improvement in the gear-mechanism includes the device of doubling the teeth of the rachet-wheel and adjustment with fixed-levers which presses a universal bar that helps escapement by one-half space only, while the fixed-levers of the 'full-characters' escape by two half-spaces. (continued on page 657).

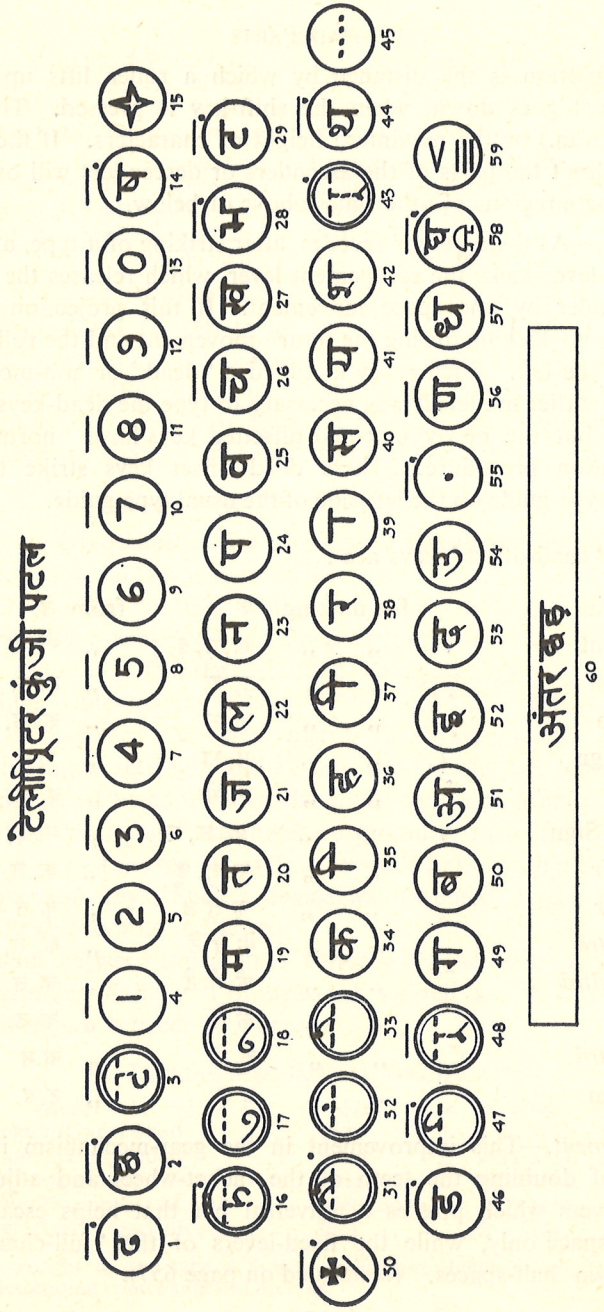

Fig. 224. Hindi Teleprinter keyboard finalised by Government of India

Legend :

1. Characters in figure shift (total 28).
2. Dead keys (total 10).
3. The positioning of characters on these keys is different from the layout on the Typewriter keyboard.

Notes :

1. The keyboard has no "shiftkeys", automatic shift shall be provided.
2. Teleprinter code for the characters may be decided by the manufacturers according to their convenience.
3. Position of key Nos. 15 and 45, *i.e.*, मैहूँ and *i. e.* बार बार may be changed according to the convenience of the manufacturer.
4. Key No. 59. shall perform the function of both carriage Return and line feed.
5. The key No. 30 " " shall perform the function of " who are you " key in the telex service. In addition it would print obliique (/) instead of the recognised sign ( ) used in English teleprinters so that in teleprinters in telegraph offices where " who are you " and " answer back " facilities are not required. This key could be used for printing oblique (/).
6. Character घ and bell are provided on the same key No. 58. Every time घ is typed bell shall also ring.
7. Half characters have not been provided on the keyboard. They shall be formed by use of *halant* sign ्, key No. 43 e.g. पंक्ति would be typed as पंक्‌ति.
8. ऋ ,ए and ऐ have not been provided on the keyboard. They would be typed as अ‌ृ, अे and अै respectively by combining अ with the appropriate *mātrā*.
9. The following characters shall be formed in the manner indicated below :

क्ष = क् + ष
त्र = त्
ज्ञ = ज्‌ + यँ.

10. Sign ऱ is not provided. sign ◌ॅ (key No. 48) shall be used in place of sign ◌ॅ also e.g. प्रेम shall be typed as प्रेम.

11. Key No. 16 ◌ॅ is used to form फ from प and ठ from ट.

12. The shape of झ in the keyboard is different from shape of झ in the typewriter keyboard. झ will be formed by combining झ of key No. 28 with ◌ॅ of key No. 16.

13. The following characters are not provided on the keyboard ङ, ञ, ◌ः, ◌ॅ and ◌ॅ

14. Key No. 55 is for the decimal sign.

15. Figure । (key No. 4) shall be shaped so as to serve the function of Viram also.

The half-space characters on the shift are :

ञ ऱ ट ड ल न ट ठ च क्ष क्ष श ऱ ट ठ ण ठ झ ढ

The half-space characters on the un-shift are :

ि, ी, ा, ह, ठ, ढ, ण, ढ

Orthography of Characters

Universally acceptable Nirnayasagar face is followed on the Russian Slug Casting Machines and by the U. S. Army Natick Laboratory. The same face is adapted to the Type-writer with only four exceptions, viz. ख, श, ल and ऋ Language Adivisory Committee of the Government of Maharashtra has now accepted revised ख and the Calcutta-type forms श, ल and ऋ.

The Roman punctuations are generally acceptable, although option has been provided in case of the *Charan-regh* (।) for orthodox Hindi and Sanskrit work. The Constituent Assembly has recommended ' International form of Indian Numerals with Devanagari. The State Governments of Maharashtra, Gujarat, Madhya Pradesh, Rajasthan, Uttar Pradesh and Bihar have however, retained the Hindi numerals already in use in the scripts concerned.

Thus, after years of controversy and discussion on standardisation, it is a matter of satisfaction that, the Ministry of Education, Government of India has been able to standardise the keyboard for Devanagari Script.

The sign-list of the Standard Typewriter Keyboard (Final-1965) conforms to the Standard Devanagari approved *vide* Government of India, Ministry of Education, Circular No. G.C.-F.4-7/57-H-2, dated 21st January 1960, (*see* pages 355-361). The same is classified below :

Vowel-Forms

	Guttural	Palatal	Lingual	Dental	Labial	Mixed	Non-joining
Initial Vowels Short :	अ	इ	ऋ	ऌ	उ	ए ऐ ओ औ	अं अः
Long :	आ	ई			ऊ		
Medial Vowel signs Mātrās :	◌ा	◌ि	◌ी	◌ॢ	◌ु	◌ू	◌ॅ ◌ॅ ◌ॅ ◌ॅ ◌ः

Consonantal Forms (Full and Half)

	HARD				SOFT									
	Inaspirates		Aspirates		Inaspirates		Aspirates		Nasals		Semi Vowels		Sibilants		Others	
	*	†	*	†	*	†	*	†	*	†	*	†	*	†	*	†
Gutturals :	क	क्	ख	ख्	ग	ग्	घ	घ्	ङ	ङ्			ह	ह्	ळ क्ष	ळ् क्ष्
Palatals :	च	च्	छ	छ्	ज	ज्	झ	झ्	ञ	ञ्	य	य् र	श	श्	ज्ञ श्र	ज्ञ् श्र्
Liaguals :	ट	ट्	ठ	ठ्	ड	ड्	ढ	ढ्	ण	ण्	र	्	ष	ष्	ड़	
Dentals :	त	त्	थ	थ्	द	द्	ध	ध्	न	न्	ल	ल्	स	स्	ढ़	
Labials :	प	प्	फ	फ्	ब	ब्	भ	भ्	म	म्	व	व्			त्र	त्र्

Note.—The *Sa-swara* letters are shown below * and *A-swar* under † (Graphically all Consonants with Vertibar (अत्यदंडित) assume, for conjugational purposes, 'half-Forms' by removal of the Vertibar. Consonants with Top-bar (शीर्षदंडित) assume 'half-Forms' by addition of = *Halant*, at their base. The Central-bar 'Half' forms of क and फ appear as क़ and फ़)

Numerical Signs

Hindi Forms :	१	२	३	४	५	६	७	८	९	०
International Forms :	1	2	3	4	5	6	7	8	9	0

Explanatory Notes :

1. The *Shiro-Rekha* (Head-line) will continue to be used.
2. Punctuation Marks : *Charan-regh* (।) and other signs as in English , . ; : - ! ?
3. Other signs : . / " " % ( ) * + × ÷ =
4. Nasal Mark : ँ , Nasal Consonantal Sign ॅ will be used.

Other Sign-lists and Keyboards

The present English Typewriter keyboard is not based on the frequencies of the characters. It is *ad hoc* arrangement which has been accepted under convention. Different keyboards have been designed by experts on the basis of frequencies but unfortunately they have not met with acceptance. Since the Indian languages using Devanagari are undergoing change every day as new words are being coined, the frequencies naturally change. However, for practical purposes the present frequency study on which the standard keyboard is based should hold good.

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